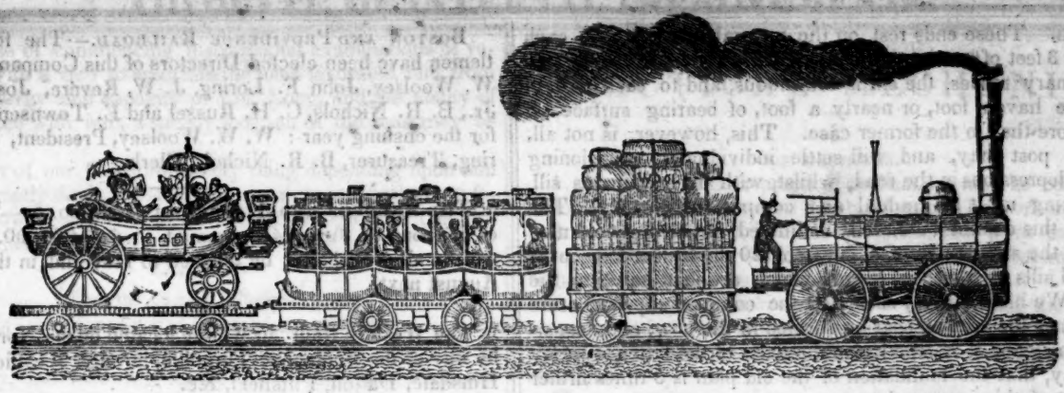

AMERICAN RAILROAD JOURNAL,
AND ADVOCATE OF INTERNAL IMPROVEMENTS.

PUBLISHED WEEKLY, AT NO. 30 WALL STREET, NEW-YORK, AT FIVE DOLLARS PER ANNUM, PAYABLE IN ADVANCE

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AMERICAN RAILROAD JOURNAL.

NEW-YORK, JULY 15, 1837.

COMPLAINTS.—This is the *age* of complaints—*some* people complain because we send them a circular, a "*dunn*" as they call it, after sending the Journal several years, without payment, as though we could live on *Pi*,—others, a small number it is true, complain because we *omit* to send our bills when due, according to the terms, *in advance*—as they wished to discontinue it, but forget to what period they had paid—others complain that they do not get the work regularly—as though we were Amos Kendall—or not at all, having *removed*, and omitted to give us notice to change the direction of the Journal—indeed these are only a *few* of the complaints which reach us, in these times of "shin plasters," and depreciated currency, we *like* to have said "of *better currency*"—whilst we, in our turn, contribute our share to the general stock of grumbling, by saying that those who have so many causes of complaint against *us* and the *Journal* will soon have their troubles, on that subject at least, removed by *its natural death*, unless those who are indebted for it soon pay the amount due.

☞ The present list of payments, during the last four weeks, shows 35 names, amounting to about $175, whilst our bills for *labor* alone, to those employed, exceed that amount. Who then is to pay for *paper, ink, rent*,—and what is to us of equal importance, as hard as the times are,—for *bread* and *beef*, to keep our *locomotives* in operation? Do not complain gentlemen delinquents, if we do remind you of the scarcity of *fuel*, as without it, the best made *Locomotives* will not *traverse* the inclined planes with short curves of the present state of affairs.

Those only may complain, who, through accident or error, are not credited when they have paid, of which we regret to say, there are a few instances, by miscarriages of the mail, and the errors of collectors, clerks and editors.

There is, at all events, *one* class of friends of whom *we* shall not complain—viz., those who remit the amount due in the best currency they can obtain—as it rests with them to say whether the Journal *shall complete its present volume.*

The report alluded to in the following communication has remained with many others waiting its turn. Its very great length will prevent us from publishing the whole—the part relating to the mode of construction we shall give in our next number. It may be well to remark that the same plan has been proposed for several other roads.

To the Editors of the Railroad Journal.

GENTLEMEN.—A few days since, I met, accidentally, with a very extraordinary report on a railroad in Canada, called "The great western railroad," written by Mr. E. Johnson (not E. F. Johnson of the New-York and Erie Railroad.) Among other curious things, this report contains a new system of constructing railroads, the merits of which I propose to investigate "pour passer le temps" in these "piping times of peace."

The superstructure consists of vertical posts, 2 feet in diameter, placed 5 feet from center to center transversely of the road, and 10 feet from center to center longitudinally. On these posts are placed the ties, 15 inches diameter, and 9 feet long, notched as usual for the rails, which are 12 inches square, or large enough to square that size, with a strip 3 × 4 placed on their upper spuare, with its least dimensions vertical, on which the iron is laid, and both are then secured to the rail by seven inch spikes.

The ordinary wooden superstructure consists of continuous longitudinal sills, from 4 to 6 inches thick, and 10 to 12 wide, to these are spiked the cross-ties, 6 inches diameter, and 3 feet from center to center, rails 6 × 6 inches, and then the iron plate. This is the lightest and cheapest superstructure in use, where locomotives are required.

Now the stiffness of the superstructure, depends 1st. On the firmess with which the posts in the one case, and the sills in the other, resist the tendency of the train to press them into the ground; and 2d. On the deflexion occasioned by the weight of an engine acting in the one case, on a rail 12 × 12 and supported at intervals of 10 feet, and in the other, on a rail 6 × 6 supported at intervals of 3 feet. For, if the posts or sills are passed into the ground, the track will be out of adjustment, no matter what the stiffness of the rails may be, and, on the other hand, if the posts or sills rest on solid rock, and the rails bend *between* the ties, the firmness of the posts and sills avails us nothing.

The area of the ends of the posts may be averaged at 3 square

feet each. These ends rest on the natural ground, and each post (or 3 feet of bearing surface) supports 10 feet of track. In the ordinary modes, the sill is continuous, and to each foot of track we have a foot, or nearly a foot, of bearing surface—3 times more than in the former case. This, however, is not all, for each post may, and will settle individually, occasioning sudden depressions in the road, whilst, with the continuous sill, this sinking must be gradual and comparatively easy. The effect of this cannot be directly estimated, but all practical men will see the superiority of a sill from 20 to 40 feet long, over detached sills of 3 feet in length, which are just equal to the posts. We have already seen, that the common superstructure has 3 times the area of bearing surface in the new, and, considering the want of connexion in the parts of the latter, we may safely say, that the foundation of the old plan is 5 times firmer than that of this improved system.

The comparative stiffness of the rails, can, however, be stated with accuracy. Deducting from each interval the diameter of the tie, we have in the one case, a beam 12 × 12 spaning a distance of 8.75 feet in the clear, in the other a beam 6 × 6 and a span of 2.5 feet in the clear. According to the principles demonstrated by Barlow, Tredgold, Dupin, etc, the relative stiffness will be, as 1 to 2.7 very nearly, or the common rail will be nearly 2¾ times stiffer than the new. With a rail 5 × 7 and bearings 2 feet in the clear, it will be very nearly 7 to 1 against Mr. Johnson's plan, yet I know from experience, that even these dimensions are barely sufficient to bear the action of 8 ton Engines.

Suppose the embankment to be 15 feet high, then for each 10 feet of road, we have 30 feet of posts. On the old place we should have 20 feet for sills, and 10 feet remaining for an intermediate tie—the sills would give 3 times the bearing surface of the posts, and the additional tie would increase the stiffness of the rail more than 8 times, and all this with the same quantity of materials. When the height is greater, the result is still more striking, for besides making the road many times stiffer, there will remain a surplus of timber.

Mr. Johnson will richly deserve the thanks of the Engineering world, should he ever produce as close an approximation to the great object of mechanical science, "a maximum of effect with a minimum of material," as he has to the converse of that proposition, in desiring this most unique arrangement of timber. It is inferior to to the common superstructure in every respect, and is a rude imitation of the plan adopted by Mr. H. Allen on the Charleston railroad, omitting however, one of the most important parts—a transvers sill *under* the posts.

Mr. Johnson is evidently under the impression, that the ground in its *natural* state (soil of course removed) offers the best foundation; whilst it is known to every Assistant in every regular corps in the United States, that the rails keep in adjustment, infinitely better on light embankment, than in cuttings or on the natural surface. The worst foundation on the old plan is therefore the best in this, for, in embankments on the new plan we have no better foundation than in cutting on the old and in cutting in the new plan the posts will go below the bottom of the ditch, the water will follow them down, and thus will be added a difficulty "sui generis," to the far too numerous ones already existing. All who have had experience in clay soils, know well how this will work.

A little experience will convince Mr. Johnson of the truth of these remarks. Should they in the mean time, meet the eye of the stockholders, and induce them to take professional advice *before* trying an "experiment," which will inevitably do for their railroads what "*the* glorious experiment" has done for our honor and prosperity, I feel very sure, they will ever bear in remembrance this communication, from

Your humble serv't. Q.

New-York, July 8th, 1837.

At a general meeting of the stockholders of the Richmond, Fredericksburg and Potomac Railroad Company, held at Richmond last week, Conway Robinson, Esq., was unanimously re-elected President of the Company. Mr. R. has tendered his resignation, but the stockholders "deemed his continuance as President of the Company, important to its best interests," and he was accordingly re-elected.

BOSTON AND PROVIDENCE RAILROAD.—The following gentlemen have been elected Directors of this Company, viz.: W. W. Woolsey, John F. Loring, J. W. Revere, Josiah Quincy, Jr., B. R. Nichols, C. H. Russel and E. Townsend.—Officers for the ensuing year: W. W. Woolsey, President, John F. Loring, Treasurer, B. R. Nichols, Clerk.

THE ANDOVER AND HAVERHILL RAILROAD.—The receipts of this road to June 24th, amount to $25,907 00. The road will, in all probability, be finished to Haverhill in the month of August next.

The Western Railroad will be located on the Northern Route, by way of the Pontoosuc Turnpike, through Westfield, Chester, Hinsdale, Dalton, Pittsfield, &c.

RAILROAD.—Stock to the amount of $3,500 was subscribed on Monday last by the citizens of this place, for the purpose of constructing and continuing the Railroad from the upper town to its termination at the foot of Lagrange street. It is expected that the work will immediately commence.—[Toledo Gaz.]

Who, in 1830, anticipated the construction of such a road, in so short a time? Who now can duly estimate the amount?

One hundred and sixty-eight passengers left Toledo on Monday morning last in Railroad Cars, with much baggage, merchandise, etc.

Seven steamboats of the largest class arrived here yesterday, six of which came direct from Buffalo, and landed upwards of one thousand passengers. Most of these passengers left yesterday and this morning in the Railroad Cars.—[Toledo, Ohio, Gaz.]

THE WESTERN AND ATLANTIC RAILROAD.

The *Standard of Union* of 20th inst. says—"We are much gratified at having it in our power to lay before our readers, extracts from several letters written by Col. Long, the States Engineer, to the Governor, upon the subject of the contemplated Railroad from Tennessee to the Cattahooche.

From the opinions expressed by Col. Long, in regard to the practicability of this great work, so far as he has examined the country through which it is destined to pass, every thing is encouraging, and no doubt remains upon our minds of its ultimate success.

We quote the following extracts from Col. Long's letters that our readers may possess as early as practicable, correct information on the subject.

"SCUDDERS, May 19th, 1837.

Dear Sir,—I have the satisfaction to apprise you, of my arrival at this place last evening, having succeeded in finding a route from the Chattahooche, thither, which I regard a very good one, vastly more favorable than any I expected to find between the two rivers."

"ALLATOONEE, May 28, 1837.

Since the date of my last, at Sandtown, I have traversed the country between that place and Campbellton, &c.

On my arrival here, I met Gen. Brisbane and Mr. Stockton who have carefully explored the country between the Chattahooche and several sources of Little River, and report two routes practicable, both of which will require an instrumental survey, in order to determine their relative merits, &c."

CASSVILLE, June 11, 1837.

During the last week, I have examined the country, by the following routes—viz: Cassville to Rome, thence via. Armutchy, &c., to Rossville—thence via. Taylors gap to Chatoogata gap—thence through the wilderness to Pigeon's Ferry—thence through the valley of the Othealoga, and downward in the valley of the Conasee Creek; and thence in a direction towards Sally Hughes' Ferry.

My observations have confirmed me in the opinion before advanced, that we can find a route from the Chattahooche, to the Tennessee line, without exceeding an ascent or descent of 30 feet per mile."

"Three parties of Engineers will be in the field in a few days

for the purpose of commencing instrumental examinations of various routes with a view to ascertain the most favorable, and from the known energy and capacity of Col. Long, and the ability of those associated with him, a speedy location of the road may be anticipated.

On the part of our Governor, every thing depending upon him has been promptly done, funds have been advanced, and every facility in his power, afforded, to advance the progress of this important undertaking."

From the Oswego Palladium.

UTICA AND SCHENECTADA RAILROAD COMPANY.

We find in a circular, recently published by the Directors of this Company, the following highly interesting information—at least, to those who take an interest in this description of public improvements. The success of th s company and its handsome dividends, will no doubt stimulate our citizens, on the first favorable change of money matters, and price of provisions and labor to finish, with as little delay as possible, the *Oswego and Utica Railroad*, by which, with the Lake, we shall be connected with the *Great Western Railroad*, throngh Canada, and which makes this route, to the north western Lakes, States and Territories, the shortest, cheapest and most expeditious, and will no doubt receive the patronage of the travelling public. We understand, that Mr. *J. Dana Allen* has completed surveys on several lines from Oswego by Rome, to Utica, for a location of the O. & U. R. R. The distance is less than the present travelled mail route, (seventy five miles.) The grades, curves and distances on direct lines are equal to any R. R. in the United States. This road has an advantage and privilege over the Utica and Schenectada R. R. in its charter, viz: to carry freight. Besides this, it has another advantage over the U. and S. R. R.—the right of choice of routes. The land on the O. and U. R. R. is generally given, while the other Co., by reference to the document above mentioned, paid $288,588 20 for land, and $62,500 to the Mohawk Turnpike Co. —total, $345,088 60! It was limited to the north side of the Mohawk, and had many difficulties to encounter. The expenditures, on account of the construction of this road, to the 31st of May, were $1,708,894 04. The items of which, are first, for right of way, as above, $345,088 60; grading road, $561,787; superstructure, $115,733; engines and cars, $122,771; buildings $71,639; engineering and superintendence, $67,381; incidental expenses, $159,472. The income of the road during the last ten months, from the actual receipts from passengers, is $257,692 20. Add for receipts of the remaining two months, June and July, estimated to be in the aggregate, (the same as the last two months, April and May,) $62,307 71; total for the year, $319,999 91. Assuming the receipts of the road for transporting passengers only, to be the same for any ordinary year hereafter, as the present current year, they will amount to $320,000. Add for carrying the United States Mail, as stipulated in contract with the Post Master General, $20,000, and the gross receipts of this road for an ordinary year, is $340,0000. Deduct for estimated expenses, $140,000, leaving an annual income, to be divided among stockholders, of $200,00. This estimate does not include a cent for future increase of travel on this road, nor does it allow any thing for a contingent decrease, unless $10,000 per annum for contingencies be considered as such allowance. Many persons believe that the increase of travlel hereafter will produce enough to renew the perishable part of the road, as often as it will require renewal; if so, the dividend of profits will be greater than the above estimate. The dividend declared for the last six months, is 7 per cent; and if we recollect right, it was for the four months previous—Sept., Oct., Nov., and Dec.—5 per cent. This certainly exhibits a flattering statement for Railroads, and will readily account for the improvement in value of *Railroad Stocks*, both in England and in this ceuntry.

LIME.—Lime is said to be an excellent remedy for burns of scalds: equal proportions of lime, water, and any kind of oil, made into a thin paste, and immediately applied and repeatedly moistened, will speedily remove the effect of a burn; and if applied later, even when the blister has risen, the remedy never fails. This paste has been known to stop effusions of blood, when almost every thing else has failed. Dry lime thrown into a flesh wound is always healing.

OUTLINES OF

PRACTICAL MECHANICS.

I.

OF MACHINES.

1. Machines, in their practical application, may be considered as tools interposed between a natural agent, or worker, and the task to be performed, in order to render that work capable of being executed which would have been difficult, if not impossible, without the aid of some such instrument.

2. We interpose machines between the agent and the work to be performed, for the following reasons, viz.:

(1.) To accommodate the direction of the moving power to the resistance;

Thus, when a man has a weight to raise to a considerable height, he may do it more convienently by the aid of a single pulley, even if the weight be not greater than he can lift by his own unassisted strength.

(2.) To render an agent having a fixed and determinate velocity, efficacious in performing work with a given velocity:

Thus, water gives to a wheel, when working most advantageously, a particular velocity, while the work which is to be done is best performed with some other velocity. Machinery must therefore be interposed to convert the velocity of the wheel into that demanded by the work.

(3.) To enable a natural agent, having a given intensity, to overcame a force or obstacle, whose intensity of resistance is greater:

Thus, a man may wish to lift a stone, or other weight, so great that it cannot be moved by his own unaided strength. In this case, by laying a prop upon the ground, on which a strong bar of wood or iron is caused to rest, he constructs an extemporaneous lever, by the aid of which he can move what would otherwise have required the united strength of several men.

3. The machines which are used in practical mechanics may be either simple or compound. The simple machines are six in number, and are called the mechanic powers. Compound machines are made up of the mechanic powers, combined with each other in various ways, and modified in various manners. In these combinations there is not only a change in the intensity and in the direction of the forces, but the character of the motion may be changed also.

4. Of the lines which any point of a machine can describe, the simplest are the straight line and the circle. If the points continue to move forwards in the same straight line the motion is said to be *continuous rectilineal*. Of this we have no instance in the parts of machines themselves, but it is often found in prime movers.

If the points, after having described a straight line, return along that line to the place whence it first set out, the motion is said to be *reciprocating rectilineal*.

If the point describe an entire circle, turning continually in the same direction, the motion is said to be *continuous circular*.

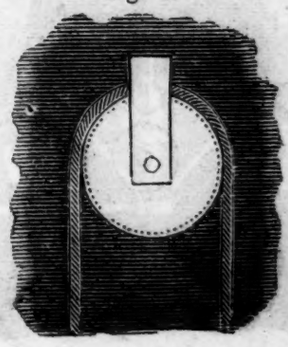
If the point move through an arc, or portion of a circle, and return along that arc to the place of beginning, the motion is said to be *reciprocating circular*.

5. Among these four kinds of motion, taken by pairs, ten possible combinations exist; but two of these never occur in practice. Machines have therefore been divided into eight series:

(1.) A continuous rectilineal motion may be converted into another of the same description, but different in direction.

Instance—a simple fixed pulley.

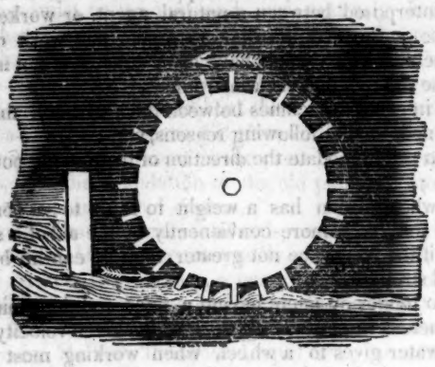
Fig. 1.



(2.) A continuous rectilineal may be converted in to a continuous circular motion, or a continuous circular motion into a continuous rectilineal motion.

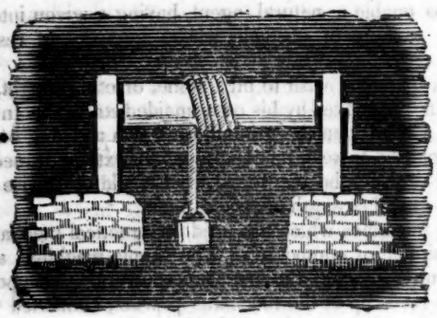
Instance 1—a water-wheel.

Fig. 2.



Instance 2—a well diggers windlass.

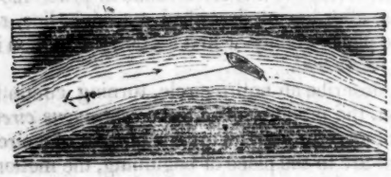
Fig. 3.



(3.) A continuous rectilineal motion may be converted into a reciprocating circular motion.

Instance—the machine used for crossing rivers, and known under the name of the flying bridge.

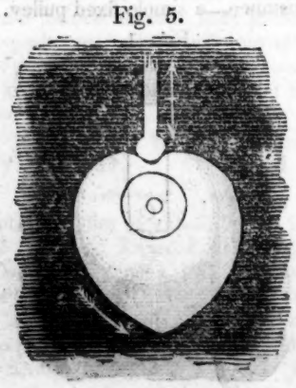
Fig. 4.



(4.) A continuous circular motion may be conuerted into a reciprocating rectilineal motion; or a reciprocating rectilineal motion into a continuous circular motion.

Instance 1—the heart wheel.

Fig. 5.

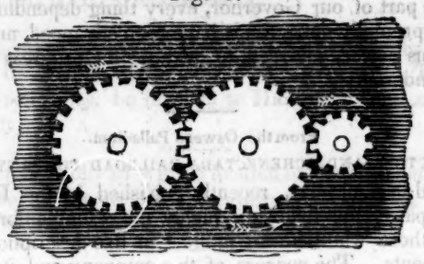


Instance 2—the crank of a horizontal steam engine.

(5.) A continuous circular motion may be converted into another of the same kind, but opposite in direction.

Instance—Toothed wheels and pinions.

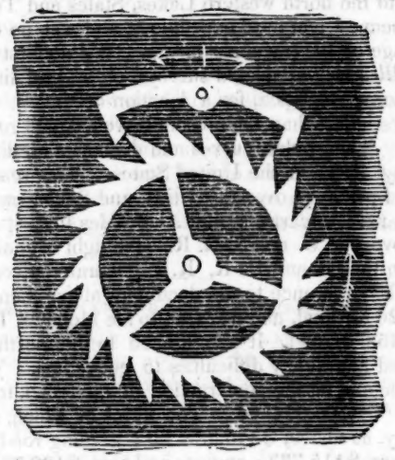
Fig. 6.



(6.) A continuous circular motion may be converted into a reciprocating circular motion; or a reciprocating into a continuous circular motion.

Instance 1—The scapement of a clock.

Fig. 7.



Instance 2—the crank of a spinning wheel.

(7.) An alternating rectilineal motion may be converted into an alternating circular motion; or an alternating circular in an alternating rectilineal motion.

Instance 1—The working beam of the usual form of steam engines.

Instance 2—The brake and rod of a pump.

(8.) An alternating circular motion may be converted into another of the same description but contrary in duration.

Instance—Toothed segments.

6. In every machine there are three motions which require to be particularly considered:

(1.) The motion of the moving power itself;

(2.) The motion of the parts of the machine which is immediately acted upon by the moving power. This is called the impelled point of the machine.

(3.) The motion of the part of the machine by which the work is performed, and which is called the working point.

7. The moving powers, or prime movers employed by mechanicians are all natural agents. The most important of these are:

(1.) The force of gravity, acting through descending weights;
(2.) The elasticity of springs;
(3.) The strength of men and animals;
(4.) Water;
(5.) Wind;
(6.) The force of the elastic vapour of water or steam.

In addition we use in a few instances the explosive energy of gunpowder. The attractions of electricity, magnetism, and affinity, are also capable of setting bodies in motion, and might therefore be applied to drive machines. But the sphere of action of these forces is so limited as to render it improbable that they can ever be applied to any useful purpose, with the exception of the electro-magnetic influence. Of this an application has recently been made which promises to be effectual.

There is also in the continually varying pressure of the atmosphere a source of power which might be applied in some few instances, and it has been used for winding up clocks. Before machines were invented, or while only those of the simpler descriptions were known, man could apply no other prime mover but his own strength. The introduction and improvement of complex machines has enabled him to call into his service the great natural agents, water, wind and steam.

8. As no motion can take place without the application of an adequate force, so no machine can act, unless driven by some natural agent. Neither can any machine long continue to work after the prime mover ceases to act. Hence, machines which shall keep up their own action, and which have been sought under the name of perpetual motion, are impossible.

9. The action of a prime mover depends not only on its own energy or intensity, but on the velocity with which it tends to cause the impelled point of a machine to move. The product of these two quantities is called momentum. The work done is also to be estimated by the quantity of resistance overcome in a given time, or by the momentum of the resistance.

Under the term resistance are included not only the useful work performed, but also friction, and all other retarding forces, such as the action of gravity, the resistance of the air, or other medium in which the motion is performed.

10. When the momentum of the prime mover exceeds that of the resistance, the machine is set in motion, and will move from a state of rest with accelerated velocity. If the prime mover be an attractive force, which acts with equal intensity upon a body whether it is at rest or in motion, the tendency to acceleration will continue. But if, as is more usually the case, the prime mover acts more forcibly upon bodies at rest than upon bodies in motion, the rate at which the impelled point of the machine is accelerated will diminish at each increase of its velocity. This diminution in the action of the accelerating force will continue until the momentum of the resistance becomes equal to that of the prime mover. The motion of the machine then becomes uniform or will vary only within certain limits. It is said to be in a state permanent working, and equilibrium exists among the moving and resisting forces.

This species of equilibrium, which occurs in the motion of a machine, is called dynamical.

11. When the prime mover is of such a nature as to act more forcibly upon a body at rest than upon a body in motion, a machine impelled by it may cease to do work from two causes; it may be loaded with such a resistance that it can no longer move; or it may move so fast as to receive no new impulse from the prime mover. Between these two states there will be a velocity of the impelled point with which the greatest possible quantity of work will be performed. This most advantageous velocity of the impelled point is, in most cases, one third of the greatest velocity of which the prime mover is capable; and the resistance which will be overcome at this velocity is four-ninths of that which will stop the motion of the machine altogether.

12. It is in most cases important, that the work of a machine shall be done with a motion of the utmost regularity. A tendency to irregularity may arise from two causes.

(1.) The prime mover may act unequally upon the impelled point of the machine, and yet vary within certain definite limits.

(2.) The prime mover may have a tendency to increase or diminish in its mean intensity and velocity, or the resistance may be subject to variation.

Each of these cases has its appropriate remedy. The first cause of irregularity may be counteracted by a fly wheel; the second by a governor.

13. A fly wheel is a heavy circular disk, usually of metal, to which a great velocity is given by the action of the prime mover, transmitted through the machine. This wheel like all other bodies, is possessed of inertia by which it resists the action of forces, tending to accelerate it, and tends to continue in motion when the action of the accelerating force ceases to act. When therefore the action of the prime mover is more than equal to the resistance, the fly wheel opposes its inertia, but still gradually acquires an increased velocity, and corresponding momentum. When the action of the accelerating force diminishes, or even ceases altogether, the fly wheel does not at once lose its velocity, but parts with it gradually, distributing through the other parts of the machine the excess of momentum it had previously acquired. Although a fly requires a part of the moving force to set it in motion, and thus in fact adds to the resistance, it notwithstanding frequently enables an irregular force to do work that it would otherwise be incapable of performing. Thus, although a man is capable of exerting a force equivalent to raising seventy pounds, yet when he turns a winch or crank, there is a part of the revolution, when his utmost force will balance no more than twenty-five pounds. If then the resistance exceed the latter quantity, he will not be able to make the crank perform an entire revolution, and consequently can do no work at all. If however a fly be applied to the crank, he will be capable of working throughout its whole revolution, with a force equivalent to the raising of a weight of thirty pounds.

The effect of a fly wheel, is proportioned to its weight, its diameter, and its velocity.

14. Some engines require no separate fly wheel, as they themselves, or some of their working parts may act in the manner of a fly. This is the case in the water wheel, which will regulate its own motion, and that of the machinery it drives.

The principle which is employed in the fly wheel, is also used for the purpose of accumulating the force derived from a long succession of impulses, and discharging it at once upon a given object.

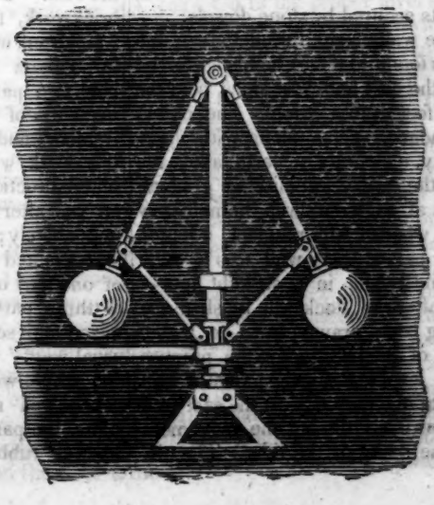
The most familiar instance of this application of the principle is to be found in the coining engine. This is a screw-press worked by a long lever, the two extremities of which are loaded with heavy weights. A rapid motion is given to this lever by the power of men, who abandon it a short time before the die is carried down to the coin. At the instant the die strikes the coin, the whole of the force which has been communicated to the weights is discharged, and thus a deep impression is produced.

15. When the intensity of the prime mover is subject to variations which are not confined within fixed limits, or when the machine may be required to perform very different quantities of work, the action of the prime mover itself is regulated by an apparatus called a governor.

A governor consists of two heavy balls suspended by means of bars from a vertical axis. Each of these bars is connected with the axis by a hinge. These bars form a part of a system of levers by which a collar may be made to move upon the vertical axis. The axis derives motion from the machine, by which a centrifugal force is communicated to the balls. This centrifugal force may acquire such intensity as to overcome the gravity of the balls. They will in consequence move onwards, and thus communicate motion, through the system of levers, to the collar upon the axis. When the velocity diminishes the balls fall inwards, and thus move the collar in an opposite direction. The collar acts upon an apparatus by which the intensity of the prime mover may be varied. Thus, in water wheels it opens or closes the shuttle by which water is admitted to the wheel; in steam engines, it works a valve by which the area of the steam pipe is increased or diminished.

One of the forms which the governor frequently assumes is represented in Fig. 8.

Fig. 8.



TRANSACTIONS OF THE INSTITUTION OF CIVIL ENGINEERS.

AN ACCOUNT OF THE HARBOR AND DOCKS AT KINGSTON-UPON-HULL.

Continued from p. 422.

Dock-walls, Plan No. 3. The foundations are all piled, with a row of 6 inch grooved sheeting piles in front; the bearing piles are 9 inches, the counterfort piles 8 inches diameter; They were all driven with a ringing engine and a ram of nearly 4 cwt., worked by fifteen or sixteen men; these piles proved to be too short for so lofty a wall, where the ground in general is so soft and compressible. Longitudinal sleepers of half timber were bolted down upon the heads of the bearing piles, the sheeting piles spiked to an inner waling of the same scantling, and the whole covered with 4 inch transverse close planking, on which the wall was raised. The timber used was Memel or Danzig, excepting the piles, which are chiefly of Norway fir.

The dock walls are all of brick, with the exception of a stone *through* course at the bottom of the fenders, three courses of stone on the level of an average tide, and the coping. The mortar was made of Warmsworth blue lime, and sharp fresh water sand only; the lime, having been ground in its dry state in a mill worked by a steam-engine, was mixed with two parts of sand, for the front work, and water having been added, the whole was gronnd again, and the mortar used immediaely afterwards, whilst hot and fresh. The backing mortar was composed of one part of unslacked lime to three parts of sand, mixed and tempered in the usual way. The brickwork of the front and back was laid in mortar, the rest grouted every course; part of these walls being built a little before winter, the front mortar was affected by the frost, but the joints were afterwards raked out and pointed with pozzuolana mortar. The *through* course at the foot of the fenders is of Barnsley stone, 15 inches thick, those in which the fenders are fixed projecting a little from the face, and having a dove-tailed groove to receive each fender; the three courses above are also of Barnsley stone, the lowest being a *through* course: these stones are all properly squared and dressed and the front *bosted*. The coping is of Bramley-fall stone, 4 feet wide and 15 inches thick, squared and dressed, the front and top well bosted, the arris rounded off, and the joints secured by stone dowels.

Before the walls were raised to their full height it was found that they had been forced forward on the east and west sides, near the middle, two feet from a straight line, carrying the foundation piling along with them. As a security, a quantity of earth, about ten feet high in the centre, diminishing gradually to six feet at each end, was immediately laid in front, where it still remains; a length of the upper part of each wall was also taken down and rebuilt in a straight line,—Some time after the dock was finished, the water having been drawn down to within thirteen feet of the bottom, for the purpose of making a level bed for the counter balance weight of the gate chains, the east wall again gave way a little, but the movement ceased on the rising of the tide. The circumstance operated as a warning not to draw the water so low in future.

All round the dock, to protect the walls, there are oak fenders 12 inches square, let 4 inches into the brickwork, and projecting 8 inches before the face, dove-tailed into stone corbels at foot, as before mentioned, and secured by oak ties with wrought iron fastenings near the top, which is covered with a cast iron cap. There are also two rows of horizontal fir fenders, 7 inches square, let into the upright ones by short tenons, with angle pieces to prevent vessels catching underneath or riding upon them, as the tide rises and falls.

Lock. The entrance lock is 158 feet long within the gates, 42 feet wide at the top, and 31 feet high above the pointing sills, on which the average depth is 26 feet at high water of spring, and 20 feet at that of neap tides.

The foundation consists of four rows of bearing piles, 16 to 19 feet long, for each wall of the chamber, and two rows for the counterforts; on the heads of these, longitudinal sleepers of half timber are bolted, transverse sleepers of the same scantling placed on edge securely fixed to them, and the whole is covered with 4 inch close planking, the interstices being filled in solid with brickwork, on which the inverted arch and side walls are built. There are five rows of 6 inch grooved sheeting piles, 16 to 20 feet long, driven across each platform, the bearing piles for which are 3 to 4 feet apart each way, and carry longitudinal sleepers, 12 inches square, with two courses of close transverse sleepers bolted thereon for 13 feet in length from the main sills, on which the pointing sills are fixed. The remainder of the platform is covered with 6 inch elm close planking, on which cast iron segments are laid for the gates to traverse upon. There is an apron or platform at the tail of this lock, about 50 feet in length, covered with 4 inch planking spiked to transverse sills, which are bolted down upon the heads of the bearing piles, with a row of six inch grooved sheeting piles at the outer end. The piles are of Norway timber, the sleepers and planking, except for the platforms, principally of Danzig fir, and the pointing and main sills of English oak.

The side walls are 6 feet 9 inches wide at top, and there are six counterforts on a side, each 6 feet square; besides the foundations for the bridge, which stand 9 feet higher than the rest. These walls and the invert are of brickwork, faced with Bramley-fall stone. The front was set in mortar composed of three parts of ground Warmsworth blue lime, two parts of ground pozzuolana, and five parts of sharp fresh water sand, properly mixed and screened, and well tempered; this work was done by men with beaters, till the erection of the mill in which the mortar was afterwards ground wholly, and used immediately; the rest of the work was set and grouted in common mortar, composed of one part of unslacked Warmsworth lime to three parts of sharp fresh water sand, mixed and screened, and tempered in the usual way. The hollow quoins are of Dundee stone, well squared and dressed, set in pozzuolana mortar, with close beds and joints, the parts in which the gates turn being well rubbed to a smooth surface, so as to be water-tight; this very hard durable stone, being of a fine grit, does but little injury to the heel posts, and is therefore very proper for hollow quoins. The south wing walls are also faced with Dundee stone for a short length. The coping is of Bramley-fall stone, 4 feet wide, by 15 inches thick, joggled together in the same manner as that of the dock walls.

Caisson. In the masonry at each end of the lock, there is a chase or groove 12 inches deep, 21 inches wide in the front, and 15 inches at the back, for receiving a caisson or floating gate, which was originally built as a preventer dam at the south end during the execution of the work, and was afterwards used to keep the tidal water out of the lock in repairing one of the gate chains; but having gone to decay, it has since been broken up. The keel was made to fit the stone groove so as to be water-tight, and about ten feet above the bottom, there was a cast iron cross cylinder, 2 feet diameter, communicating with the water on either side, by means of four apertures, 9 inches diameter, fitted with brass plugs worked by screws and rods, reaching to the deck, by which the water was admitted to sink the caisson in its place, and let out at low water when no longer wanted, so that, the plugs being inserted, the vessel rose by its own buoyancy the succeeding tide. This gate or vessel being very deep, and only 22 feet 6 inches in beam, was kept in a vertical position by about thirty tons of ballast.

Gates. The lock gates are all of English oak, except the planking, which is of fir; they are 31 feet 4 inches high above the pointing sills, and 25 feet 6 inches broad, measured in the curve line, the camber being 14¾ inches; the thickness is 16½ inches at the heel, and 14½ inches at the head. the 3 inch close planking included. Each gate originally consisted of twelve bars framed into the head and heel, and further secured by wrought iron straps and bolts; but a few years after they were put up, several of the lower bars being broken by the great pressure of the water and the heavy stroke of the sea in stormy weather, they were replaced by new ones, and several additional bars inserted, so that the gates are now a solid mass of timber (excepting the cloughs) for ten feet from the bottom. There are two cast iron sluices to every gate, each 3 feet square in the clear, worked by a wrought iron screw, with a sluice rod reaching to the top. The machinery for opening and shutting consists of a 6 inch pinion, working into a cog-wheel 4 feet diameter, on the axis of which is a cast iron roller 2 feet 9 inches long by 10½ inches diameter, for the gate chain to wind on. The other parts of the gates and their appendages are so much like those of the Old dock lock, that it is deemed unnecessary to repeat the description.

Before the piers of the entrance basin were erected, the waves from the Humber sometimes forced open the outer gates a little notwithstanding the great pressure of water behind; and the violent concussion in shutting fractured the lower bars, as already mentioned, and would in all probability soon have destroyed the gates had they remained

much longer exposed. Since the erection of the piers the swell is much diminished; but even now, with strong gales from the south, it is dangerous to attempt to open or shut the gates by the machinery, and at such times recourse is had to blocks and tackle provided for the purpose. When the gates are left open after high water also, the current out of this lock, in particular, is so strong as to require great caution in shutting them; this used to be done at such times by what is termed *back handling*, that is, the gate-men standing at the machinery for opening, keep a tight hand upon it, to prevent the gates from closing too forcibly; but recently a safer and more simple plan has been adopted, namely, by a rope hooked to each gate head, and taking a turn round the mooring posts on each side of the lock, by which the gates can be eased to with the greatest safety.

Bridge. Over the centre of this lock there is a swivel bridge, 12 feet 3 inches wide; it is 81 feet 9 inches long, and composed of two parts, which, meeting in the middle, form a segment of a circle.—The bridge consists of six cast iron ribs, about 2 inches thick in the plain part, and 2½ inches at the lower edge, connected together by cast iron braces, and planked with 2½ inch oak, which is protected by a covering of 1¼ inch fir. The foot-paths, each 2 feet 8 inches wide, are slightly raised above the carriage way on oak joists, covered with fir boards, and have cast iron curbs next the road way; a wrought iron railing, 3 feet 7 inches high, runs along each side. On each side of the lock, in the stone coping of a large brick pier, there is firmly imbedded a cast iron circular plate, 11 feet 9 inches diameter by 6 inches wide, with a cross and pivot in the centre, also securely let into the masonry, and working in a socket underneath the bridge, with twenty conical collars, 6 inches wide, by 10¾ inches diameter at one end and 9¾ inches at the other, fitted in a frame, and revolving between the circular plate above mentioned and a similar plate in the under side of the bridge. The ends or meeting parts of the bridge are not described from the centre pivot or axis of motion, but from a point a little on one side thereof, whereby these parts, in shutting into a tongue and grooved joint, do not come into actual contact till the bridge is shut; it is then completely fast, being closely wedged to the abutments on each side and kept in place by two keys at the meeting, thus making the whole firm and secure. The machinery for opening and shutting the bridge, consists of two 8 inch bevel pinions, to one of which the handle is applied, and at the bottom of the vertical shaft of the other is fixed a 9 inch pinion, working into a spur wheel, 4 feet diameter, on the axis of which is another pinion, 12 inches diameter, which turns the bridge by means of a toothed segment at the outer end. One man can open or shut either part of the bridge with ease in half a minute. Messrs. Ayden and Etwell, already named in the account of the Old dock, constructed this bridge also.

Basin walls. The walls of the entrance basin are so much like those of the dock, that a very brief description may suffice. They are ten feet wide at the bottom by 6 feet at the top, fronted entirely with Bramley-fall stone, and having two *through* courses, and a stone coping, similar to the dock; the rest of the wall and counterforts is of brickwork; the front masonry, and also the back of the walls, are set in pozzuolana mortar, the remainder in common mortar, of the same proportions and mixed as for the lock. There are three rows of stout piling, 16 to 18 feet long, under the walls, and a row of 6 inch grooved sheeting piles, 16 feet long, in front, with transverse sleepers, and close planking over all; the counterforts are piled and planked in the same way. There was also a quantity of Hessle-cliff stone rammed between the foundation timbers, and about two feet in width behind the walls. This wall, on the outside of the coffer-dam, was wholly executed in tide-work.

Quays. The quays are paved with spurn pebbles; the east side, and the south up to the lock, form a legal quay, upwards of 1000 feet long; the drainage is into the sewers by gratings every twenty-five yards.

Moorings. The mooring posts are about 10 yards apart, and 4 yards from the side of the dock; they are of wood, iron, and stone. The wooden ones are simply round oak trees, 18 inches diameter at the top, driven firmly into the ground by pile-engines, and having two shores, a little below the surface of the ground, abutting on the back of the wall, by which the strain of the shipping upon the posts is transferred to the wall; a plan that cannot be recommended. The iron posts (twelve pounder cannon) are 9 or 10 feet long, the breech or lower end being let into a stone block, and secured thereto by wrought iron straps and bolts, and also built round with brickwork up to near the surface of the ground. I understand that some of these posts are secured by land ties, but in general there is only a large stone laid to the back of the coping thus throwing the strain upon the wall, as noticed above, in the case of the wooden moorings. The stone posts are of Peterhead granite and Dundee sand stone, of similar dimensions, and secured in like manner, to those at the Old dock: but from their being too much tapered near the ground, several have been broken by the heavy strain in windy weather.

Dolphins. There are four dolphins in this dock, each consisting of five piles, the centre one perpendicular and standing above the others, which are battering, and the whole secured together by two tiers of cross braces, and planked over on top and sides, for 11 feet. These dolphins were erected at the time the Junction dock was made, for the purpose of warping vessels in their passage to and from that dock, as well as for the more convenient moorings of ships on the west side of the Old dock.

Sheds and Cranes A range of sheds 750 feet long. 25 feet wide, and 15 feet from the side, extends along the legal quay on the east side of the dock: they are principally of fir timber, covered with weather boarding and enclosed with large doors on the east, but open on the west, except the bale shed at the south end, which is all enclosed, with large doors on each side. The roof is covered with blue slate, and the floor formed with 6 inch flags for a width of 15 feet, the rest being paved with spurn pebbles.

There are seven cast iron cranes to this dock, four on the east and three on the west side; the large one near the north-west corner is a *well* crane, calculated to lift 10 tons; the vertical shaft is 5 feet 3 inches from the side of the dock, and its foot 15 feet below the coping, the jib is 19 feet 3 inches high to the under side of the pulley, and projects 22 feet. The other six cranes are all of the *pillar* kind, and calculated to lift 3 tons. The pillar is six feet high, and fixed at a distance of 5 feet from the dock, in a socket in the centre of a cast iron cross, securly bolted to the coping. The jib is 16 feet 6 inches high, projects 15 feet, and is moveable on the pillar by a pivot and socket at the top, and a cast iron collar faced with brass at the bottom.

There are four wooden cranes to the basin, three of them well cranes calculated to lift 3 or 4 tons, and the other, which has been recently put up, a pillar crane for 2 tons; the jibs of all project about 20 feet, or 13 feet beyond the basin wall. These cranes are principally used for steam-packets.

Cleansing dock. This dock was not cleansed for three years and a half after it was opened, the dredging machine and mud boats not being completed until then: and such is the impurity of the water in the Humber, that during this time the mud had accumulated to the height of twelve feet at the south end of the dock, and three feet at the north, so that deeply laden vessels were prevented, at neap tides, from entering or going out.

Dredging machine. The dredging machine is worked by a steam-engine fixed on board a square flat bottomed vessel, 80 feet long, 20 feet wide, and drawing 5 feet water. The engine is 6 horse power, and works a 2 feet stroke forty strokes per minute, giving motion, by means of a bell crank, to four cog wheels, on the axis of the upper of which is a square tumbler, with one corresponding at the lower end of the bucket frame.—Round these the wrought iron buckets, 29 in number, revolve by an endless chain, and the mud is discharged over the upper tumbler into a spout leading into lighters lying alongside; the ladder turns on an axis at the upper end, and the lower end is raised or lowered through an opening in the middle of the boat, by a crab and tackling fixed directly over it, by which the buckets are adapted to the proper level for taking up the mud. The vessel is drawn to its work by means of a cable revolving round a roller attached to the engine, and from it by two men at a crab in the stern; there is also a contrivance for moving it sidewise when required. It is usual in inland navigations and canals, where the dredging machine has to pass through locks and bridges, to have the buckets in the middle of the vessel, as in the present instance; but in docks, harbors, &c., where there is no want of room, they are much better on the outside, as there is less waste in discharging the mud into the lighters, and there may be a double set of buckets, one on each side, if necessary.

Four men, including the engine-keeper, are required to work this machine, and two more to attend the lighters. The work has for a short time been upwards of 2 tons per

minute, (or twelve buckets of 4 cwt. each,) and where the mud is in plenty and there is no impediment, 60 tons per hour may easily be raised; but the ordinary work is about 45 tons an hour, or twelve boats containing from 500 to 550 tons per day of twelve to fifteen hours.

Mud boats. Plan. No. 4. The mud boats are flat bottomed and sharp at each end, and draw, when fully laden, about 4 feet water. Six of them, which were formerly used exclusively for the Old dock, are 48 feet long at top, 17 feet 6 inches wide in midships, by 5 feet 6 inches deep, and carry 40 tons on an average; the six Humber lock boats are rather larger, carrying 48 tons each. They are ceiled inside in a sloping direction like a hopper, with two trap doors in the bottom, through which the mud is discharged, the water rising in the boat to the same level as on the outside, but the cavity between the ceaing and the bottom preserving the buoyancy.

When laden, these boats are linked together in pairs, six usually forming a set, which require ten or twelve men to work them; they generally go out of dock when the gates are all open.d, a little before high water, and are warped 100 or 150 fathoms from the pier-head, where the mud is discharged; the empty boats then return to the dock, the time occupied being usually from two to three hours, according to the rapidity of the tide, and as the passage is more or less clear of shipping.

Quantity of mud. The quantity of mud taken out of this dock, was about 36,000 tons a year before the Junction dock was made; since then it has been about 30,000 tons, the diminution arising from the water being now in part supplied from the river Hull, which is much purer than the Humber,* and having also to flow through the Old and Junction docks, where a great part of the mud is deposited.

Scouring of basin. The tide-basin being connected with a river highly charged with mud, it was necessary to make provision for cleansing it. The head or north end of the basin, is partly scoured by water from the lock, conveyed 130 feet in two cast iron pipes laid close behind the wall, and 4 feet diameter next the lock, diminishing to 2 feet 6 inches at the outer end; these pipes are in 9 feet lengths, each 30 to 35 cwt., with flanches at the ends bolted together, and resting on a cap-sill, supported by two piles at each joint. To these mains, at equal distances, are connected ten 18 inch pipes on each side of the lock, which discharge themselves through the basin wall, about 5 feet above the level of the sills, on a wooden apron 40 feet wide, laid in front to prevent the foundations from being undermined. Two other mains, also 4 feet diameter, are connected with the dock, one at the south east, the other at the south west corner, terminating at the south-east and south-west corners of the basin respectively; their bottom being about two feet above the level of the lock sills, and aprons placed at the ends, similar to those at the head of the basin. These pipes were intended to scour away the mud along the inner sides of the piers, and also to assist in preserving a deep channel between the heads. There is a vertical cylinder, 4 feet 6 inches diameter, to each of the latter pipes, near the corner of the dock, with a cast iron sluice at bottom for opening and shutting; the sluices for the scouring pipes at the head of the basin are in the face of the lock wall, in the gate recesses; they are all worked by wrought iron screws with handles at the upper end of the sluice-rod. Several of the pipes from the dock to the basin, from being too slight, failed before the dock was opened, and were replaced, at great labor and expense, by new ones; others, which were less fractured, were repaired and strengthened by ribs in the inside.

To show the effect of these sluices, I would state that the four from the lock, and the small ones at the head of the basin only, when all open, lower the water in the Humber dock a foot in four minutes: the latter, with the two from the dock, are generally worked at low water, twice every spring-tide, and notwithstanding their great power, only scour out a narrow channel at each place, sufficient for the steam-packets and small craft to lie in; but being assisted by the sluices of the gates, the main channel from the lock into the Humber is effectually scoured, and maintained to nearly the depth of the sills. Over the rest of the basin the sluicing has no power whatever, and the mud deposited there has been removed by manual labor, at great expense; two mud lighters having been, till within the last two years, almost constantly employed upon it since the dock was opened.

It having occurred to the writer of this, that the water wasted in locking might be beneficially used in cleansing the basin, he recommended a new scouring pipe to be laid at the north east corner, on a much higher level than the other pipes for the purpose. A new 4 feet pipe was accordingly put down in the spring of 1831; from its junction with the old pipe to the outlet in front of the basin wall is 18 feet, and the bottom at the outer end is 10 feet 6 inches above the lock sill. There is a sluice, worked by a rack and pinion, at the top of a brick shaft or well, to stop the old pipe and divert the water through the new one, when in use; at other times, this sluice being drawn up, the water is discharged as before. At the outer end of the new pipe is a wooden spout, 18 feet long, turning on hinges in the wall, so as to be reared up against it when not in use, and to the end of this another spout, 85 feet long, is connected, which can be turned so as to scour in almost any direction. It should be observed, that the largest quantity of mud is deposited on this side of the basin, and that, before the making of this sluice, it had accumulated to a great height, and become so exceedingly hard and tenacious, that it was found necessary to remove it into the stream by workmen with spaddles. In this manner about 12,000 tons of mud were removed in eight weeks after the sluice was set to work. Since that time there has been only one man to attend the sluice abont three or four days every spring tide, except when clearing away the mud alongside the east wall and near the east pier, which cannot be done by the scouring power alone. The new sluice, when in full operation, lowers the water in the three docks about 6 inches an hour, and usually runs about three or four hours each tide.

Sewers. The sewers are all of brick, and are 3 feet wide by 4 feet high; that on the east side commences at the end of Myton-gate, at a depth of 8 feet 6 inches below the dock coping, and terminates at the north end of the basin 4 feet lower, the extremity being closed by a flap, opening outwards, to discharge the drainage water and shut out the tide. This sewer was formerly cleansed by manual labor, but is now scoured by a sluice constructed for the purpose on the east side of the Junction dock. The sewer on the west side discharges itself into one in Kingston-street, which leads to the general outfall into the Humber, at Limekiln Creek.

There is an iron sluice at the north east corner of the dock, 7 feet 6 inches below the coping, protected by a wooden door, worked by a screw, and having an iron conduit, 2 feet 6 inches wide by 2 feet high, leading from it to scour the town sewers.

Dock opened. The water was let in on the 3d of December, 1808, and the dock publicly opened for business, with due honors, on the 30th of June, 1809. The expense was defrayed by the Dock Company, and the Corporation and Trinity House jointly, the two latter contributing one moiety of the expense, and the Company the other, for which purpose sixty new shares were created, under the authority of an Act of Parliament.

Pier heads. Plans, No. 5, 6, and 7. The piers of the entrance basin were begun soon after the dock was opened: their construction will be better understood from the drawings than by description. They are wholly of fir, of the scantlings stated on the plan No. 7, and the filling up or hearting is of Hessle-cliff stone; the sheet piling on both sides was grooved. The passage between the heads is 105 feet at the top.

To be Continued.

*The respective quantities of deposit of the two rivers are found, by experience, to be nearly as one to three.

VALUABLE INVENTION.—It is remarkable that an invention far more valuable to all who travel upon the seas, lakes, and rivers of this great commercial country, and more important, on the score of humanity, than any other devised by human ingenuity, should remain in comparative oblivion and neglect. We allude to that beautiful preparation of *pulverized cork*, for seamen's and passengers' mattrasses and beds. Will it be believed that a mattrass made of this material, weighing only twenty-five pounds cannot be sunk by the weight of seven men? and that one or two persons might float on it in the midst of the ocean, with as great security from drowning, as if he were on board a ship? Yet such is a fact, as demonstrated by experiment. The beds, cushions, &c., made of this preparation of cork, are more elastic, soft and comfortable than those of the best hair, and have the superior advantage of never becoming matted. Every ship and steamboat should immediately substitute them for all others, and even passengers going to sea should purchase one.—[New Era.]

From the London Journal of Arts and Sciences.

A SOLVENT NOT HITHERTO USED IN THE ARTS.

Concluded.

The speedy evaporation of the caoutchoucine, of course, produces intense cold; it has been found to reduce the thermometer 10 degrees below zero of Fahrenheit, from 60 degrees above, in a minute and a quarter. At about 10 degrees above zero, a very remarkable concretion takes place resembling snow on the bulb of the thermometer, termed by Dr. Faraday the Bicarburet of Hydrogen; and it is believed that this is one of the new products alluded to, as discovered by Professor Mitscherlich.

Dr. Ure first exhibited this experiment, which may easily be repeated by tying round the bulb of the thermometer a piece of thin muslin, and blowing upon it with a pair of bellows while the fluid is dropped upon it.

If a current of hydrogen gas be made to pass through the higly rectified liquid, it will carry up with it a considerable portion, and become an illuminating gas of great brilliancy and beauty. This experiment was tried by Dr. Hue at the Hospital laboratory, and the combination of the two vapors remained perfect several days, though the application of greater cold might have caused them to separate.

If the hydrogen gas and the highly rectified fluid could be *cheaply* procured, a most excellent portable light would be the result; but the expense of both is at present a bar to such a plan.

This new material is a solvent for all the resinous gums, particularly for gum copal, which it dissolves without artificial heat, at the ordinary temperature of the atmosphere; a property possessed by no other solvent known; and hence it is particularly useful for making varnishes in general. It also mixes readily with oils, and will be found to be a valuable and cheap menstruum for liquefying oil paints; and, without in the slightest degree affecting the most delicate colors, will, from its ready evaporation, cause the paint to dry almost instantly.

Cocoa-nut oil, at the common temperature of the atmosphere, always assumes a concrete form; but a portion of this caoutchoucine mixed with it will cause the oil to become fluid, and to retain sufficient fluidity to burn in a common lamp with extraordinary brilliancy.

The importance and singularity of this new material has induced Dr. Faraday to bring it under the notice of the members of the Royal Institution, before whom, in a very interesting lecture, he explained and exhibited many of its properties; and we cannot better close our observations on this subject, than by giving a report of the Doctor's lecture.

The lecturer commenced by describing the process adopted by the patentee for decomposing caoutchouc, and converting it into the new spirit or material denominated caoutchoucine; and observed that those who are not acquainted with the very extensive works erected by Messrs. Enderby and Company, at Greenwich, in whom the patent right is vested, it may be interesting to know, that the preparation and manufacture of the New Zealand flax, for the production of ropes and cordage, has been a principal object of their exertions; and that in prosecuting this manufacture, in which they have spared neither talent nor expense, in order to render the ropes impervious to water, and preserve them from the destructive effects of damp by saturating the fibres in a solution of India rubber, they have been lead to the discovery which formed the chief subject of the lecture.

The great urbanity and freedom with which Messrs Enderby have shown this establishment to their numerous scientific visiters, is a feature so different from the usual calculating secrecy of mercantile houses, that we deem it right to notice the circumstance as an omen of a more enlightened age, wherein all shall be willing to impart those seeds of knowledge and of truth, which, while they do not injure the parent tree, become the prolific source of benefit to the public at large.

After exhibiting living specimens of the plant from which the caoutchouc is manufactured, of the sap, which appeared like cream, and of the various forms in which the India rubber is imported, the Doctor alluded to its first introduction into commerce about 70 years ago, when it was sold by Mr. Narine, the mathematical instrument maker, of Cornhill, in cubical pieces of about half an inch square at 3*s.* each, which he recommended as a convenient means of destroying the traces of black lead pencils; whence it derived the name of India rubber, which it still retains.

Such a limited application of caoutchouc continued until within a very few years of the present time; but latterly it has been found available to a multitude of purposes connected with manufactures and the mechanical arts, so much so, that we learn the quantity now imported into this country exceeds the enormous sum of 200 tons per annum.*

Messrs. Enderby have at this time more than 100 tons actually in process of operation at their manufactory, where it is used, when melted with tar, for dressing or paying, as it is called, the ropes and cordage, manufactured by them from the New Zealand flax, and also for the distillation of the caoutchoucine spirit above alluded to, which is coming largely into use for the various purposes stated.

In the production of light about 1 quater of the caoutchoucine dissolves the cocoa-nut oil, and forms an excellent fluid for lamps, one of which (a French Argand) was exhibited on the lecture table, and burnt with peculiar brilliancy. Dr. Faraday then alluded to another application of this spirit to the lamps invented by Mr. Beale, who was present and exhibited their action. This lamp, which has been made the subject of a patent, we shall probably describe in our next.

After briefly adverting to the various important applications of caoutchouc by Messrs. Mac Intosh, Hancock, and others, to articles of domestic and surgical clothing, beautiful specimens of which were exhibited, Dr. Faraday proceeded to the more immediate object of the lecture; and in speaking of the composition of caoutchouc, particularly adverted to the extraordinary quantity of carbon contained in it; namely, 68 of carbon to 10 of hydrogen; forming what is termed a hydro-carbon. The lecturer then placed a very small quantity of the cream-like sap in a capsule over a spirit lamp, by which the caoutchouc was coagulated into a solid substance, and appeared in surprising quantity, more especially as the sap had already deposited an immense quantity of solid caoutchouc in the bottle from which that small quantity was poured. Dr. Faraday then remarked as an extraordinary fact, that the composition of the caoutchouc did not seem altered, although its properties are completely changed when, by melting, it is converted into a viscid matter incapable of again coagulating; and when, by a still higher heat it is distilled over into the spirit termed caoutchoucine (10 parts of which are obtained from 12 of solid caoutchouc, and when rectified has a specific gravity of .680, being lighter than ether, and presenting a most remarkable instance of the quantity of solid matter that can be suspended in a liquid form.)

What is most extraordinary in the opinion of the Doctor is, that this very liquid is itself a solvent for caoutchouc in a natural state, and deposites it on evaporation unaltered, affording a grand desideratum in the arts, and promising a most abundant source of useful manufactures.

Caoutchoucine is extremely volatile; and yet its vapor is so exceedingly heavy that it may be poured, without the liquor, from one vessel to another like water. A portion of the vapor was poured into an open glass vessel, which, of course, seemed to contain nothing, and yet, when carried towards a lamp, placed at the extremity of the lecture table, and then inverted, or rather the vapor poured out into the flame of the lamp, when it immediately inflamed, and thus most satisfactorily establishing its presence in the open glass vessel; and consequently its weight, which had prevented its escape through the vessel had been removed, affording a most satisfactory proof of these facts, and of amusement to the spectators generally.

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* Previous to October, 1832, the duty levied upon elastic gum (as it was called) was 5*d.* per lb., or nearly 50*l.* per ton. Its extensive introduction was thereby entirely precluded. The Legislature have, subsequent to that period, reduced the duty to 1*l.* per ton; hence its increased importation and consumption, which is still greatly increasing.

The supply of this material is inexhaustible; the banks of the river Amazon, as reported by Messrs. Enderby's agents sent out expressly for that purpose, are covered with forests of trees producing it in large quantities, and from Java alone the world might be supplied.

WILMINGTON AND SUSQUEHANNA RAILROAD.—At a meeting of the Directors held in the city of Wilmington, on Monday last, the following persons were elected to the offices that precede their names:

General Superintendent—George Craig.
Agent at Depot—James Frazier.
Superintendent of Motive Power—James Elliott.
Superintendent at Elkton—Zebulon Rudolph.
Superintendent of Locomotives.—William Huston and Ellicot Hewes.
Conductor of Trains—Robert M. Hill and Caleb T. Swayne.—[Delaware Gaz.]

THE DELAWARE CANAL.—We published in our last that it was rumored that the business on the lower section of this canal would be suspended for a week or two, in order to repair the aqueduct over Hough's Creek, which gave way on Saturday a-week. The damage sustained was not so great as many feared, and it is with pleasure we state that the Supervisors had the aqueduct thoroughly repaired, and the whole line in full flow of business in a few days after the accident happened.

The officers who have this important branch of our internal improvements under their charge, are the right kind of men for such a service. When breaches or other injury takes place on the line, they are at their post night and day—rain or shine—and having a practical knowledge of cannalling, they are enabled to accomplish in *days* what under other circumstances would require *weeks*; thereby adding thousands of dollars to the funds of the Commonwealth.—[Easton Whig.]

The receipts of the Boston and Worcester Railroad, last week, amounted to nearly $5000.

Agriculture, &c.

SHORT NOTICE OF A NEW MANURE [MADE OF HUMAN EXCREMENT] MUCH USED IN FRANCE, AND A PROPOSAL FOR ITS INTRODUCTION INTO ENGLAND.

[The following article was found in our latest received British periodical, after the last of the foregoing numbers on "The Police of Health" was in type. This furnishes both newer and more particular evidence of the value of the kind of town manure under consideration.—ED. FAR. REG.]

Messrs. Payen and Buran, of Paris, having discovered a composition which disinfects human excrement, and all animal substances, and renders them the most fertilizing manure, perfectly free from any obnoxious odor, and in a pulverized state, now manufacture it on a large scale in France, where it is generally used. Some individuals, who have purchased the right and taken out a patent for the invention in the British Empire, purpose manufacturing it in this country; to effect which object they are desirous that a few capitalists, more particularly those who are interested in Agriculture, should join them in raising the small sum which will be required for that purpose.

Allowing amply for all contingencies, it is estimated by competent persons that £6,000 will be required for establishing a manufactory for the above manure; £4,000 of which has been already subscribed, and on which it can be shown, by a moderate calculation, that fifty per cent. annual profit can safely be anticipated.

The following tables show the comparative expense and advantages of the old and new systems of manure, as tried upon two separate arpents (1 acre 2 roods 30 6-13ths perches;) of the same soil in the neighborhood of Paris, by an experienced practical agriculturist, one being manured according to the usual custom of the country, and the other with the improved manure.

OLD SYSTEM.

Expense of Manure.

		£	s.	d.
1st year, twenty cart loads stable dung, at 6 *frs.* (4*s* 9*d* 1-7*d*) a load, which lasts for three years.	120*f.*	4	15	2 4/7
2nd year	0*f.*	0	0	0
3rd year	0*f.*	0	0	0
	120*f.*	4	15	2 4/7

Produce of Crops.

1st year seven setiers (30 bush.) of corn, at 20*f.* (15*s* 10 1-2*d*)	140*f.*	5	11	1 1/3
2nd year, five setiers oats 21 bush. 1-8 pk. at 18*f.* (14*s* 3 3-7*d*	90*f.*	3	11	5 1/7
3rd year, green crops	90*f.*	3	11	5 1/7
	320*f.*	12	13	11 13/21

NEW SYSTEM.

Expense of Manure.

1st year, eight hectolitres (15 cwt. 2 qrs. 16lb. at 5*f.* (3*s* 11½ 3-1)	40*f.*	1	11	9
2nd year, do.	40*f.*	1	11	9
3rd do., no manure	0*f.*	0	0	0
	80*f.*	3	3	6

Produce of Crops.

1st year, seven setiers of corn (30 bush.) at 20*f.* (15*s.* 10½*d*)	140*f.*	5	11	1½
2nd year, seven setiers (30 bush.) of do.	140*f.*	5	11	1½
3rd year, five setiers (21 bush. 1-8 pk.) of oats at 18*f.* (14*s* 3 3-7*d*	90*f.*	3	11	5 1/7
	370*f.*	14	13	7 7/21

From which it appears that with a reduced expenditure of 40*frs.* (£1 11*s.* 9*d.*) an increase of 50*fcs.* (£1 19*s.* 8*d.*) in the value of the crop was obtained, thereby giving a gross total advantage in three years of 90*frs.* (£3 11*s* 5 1-7*d*) in the new system over the old system, or at the rate of 30 francs (per French arpent,) or 23*s.* per English acre per annum.

We are also informed by the same individual, that the new manure possesses the following desirable qualities, viz: the decided improvement of the land, economy in the conveyance, cleanliness in the crops, freedom from weeds, the production of a stronger ear of corn, and, lastly, that long-sought for desideratum by the farmer, the destruction of the fly.

Extracts from the reports of the different learned societies and the public journals in France, which have expressed the highest opinion of this successful discovery, for which the inventor received from the Academy of Sciences in France on the 8th September, 1834, a prize of 8,000 francs:—

Agricultural Society of the Seine and L'Oise.

Extracts from remarks on differents sorts of manure by M. de Cauville. This society has voted the insertion of this paper amongst its memoirs, with the hope by this means of inducing agriculturalists to repeat the experiments of Decauville.

"Amongst manures there are several new ones; but many farmers, not knowing their value, hesitated to use them, and thus deprive themselves of valuable resources. Having this year tried some experiments upon several of them, I have now the honor to communicate to you the result.

"In a piece of clayey and chalky ground of the extent of thirteen French acres (nearly eleven English) which did not possess much fertility, I had some barely sown after two ploughings, and at the same time, I spread the following manures. On the first part the blood manure made by Mr. Derosne; on the second, the animalized black (made by Messrs. Payen and Buran;) on the third, the disinfected soil [human excrements] of Messrs Payen and Buran; on the fourth, the Laine manure; on the fifth, the Boulogne soil.

"In order to ascertain the duration of the different manures, I sowed some lucerne amongst the barley, and the following crops served to show those which act the longest on the soil; three farmers were chosen as judges, one a member of this society, who were ignorant of the manure which had been employed, and the following is their decision. All the manures produced some effect, compared with that part which had no manure, the most efficacious was the *disinfected soil*; the second, the animalized black; the third, the blood manure; the fourth, the soil of Boulogne; the fifth, the Laine manure."

Extract from a report of Mr. C. Brianne, director of the model farm of Grignon, 20th September, 1834:—

"In a course of experiments, I manured about one hundred acres of rye and wheat with animalized black in the department de l' Aube, at forty leagues from Grignon; although the season

was not favorable, one can inquire of the people of the country, if they have ever seen a finer crop in the world."

Extract from a report made to the Horticultural Society of Paris, by the Viscount Debonnaire de Gif.

"The result of my examination of the effect produced by this new manure in horticultural proceedings is this: that this pulverised compound appears to hasten the development of vegetables, and consequently accelerates their fructification; that it does not possess the bad quality of containing the seeds of weeds; that it improves by degrees the soil, and produces more abundant crops; and it can, consequently, be applied to garden plants, which exhaust the soil, nor does it impart any disagreeable flavor to fruits or vegetables. It likewise adds considerably to the growth and beauty of the dahlia, and other bulbous roots. The facility of its conveyance is also a great recommendation."

Several attestations of persons, who have witnessed the disinfecting process both in France and England, are in possession of the individuals who propose to introduce this manure into England, and may be seen at T. G. Margary's, Esq., solicitor to the patentees, Quality-court, Chancery-lane, from whom any further information can be obtained.

N. B. Many preparations for night soil have been used for some years, both in England and France, but none of them are allowed to possess the superior qualities of the one which it is now proposed to offer to the British public.

Bone Dust.—Upwards of 10,000 bushels of bone dust were sold at Maduff, Ivernesshire, on Monday se'nnight, many people have come upwards of thirty miles for it. It is supposed that there could not have been fewer than three hundred carts in town; and a greater bustle was never witnessed by the oldest inhabitants.

From the New-York Farmer.

Poudrette, *French mode of Preparation; its value in France, &c. &c.*

We are enabled by the politeness of an intelligent French gentleman, to give useful information in relation to the mode of preparation, in Paris, of this valuable manure.

The material, the contents, of privies, is taken beyond the limits of the city, into a large enclosure, with reservoirs into which the solid part is put, to the depth of 18 to 20 inches, when from *one tenth*, to one *eighth* in quantity of *dry earth* is mixed with it—and then the mass is left to the influence of solar evaporation. The length of time required to carry it through the process of preparation varies from *one*, to *two*, and sometimes even to *three* years—which renders it both tedious and expensive; yet so highly is the article valued, by the agricultural community, that the privilege of the *monopoly*, is sold by the city, to the highest bidder, for periods of *nine years each*; and companies are formed, consisting of *intelligent* and *wealthy* men, which *compete for the privilege* of monopoly. The present company pays to the city of Paris *one hundred and thirty thousand dollars*, for the *exclusive* privilege of removing and *using* the contents of the privies—the company, of course, have the right to charge the proprietors a certain price for the removal.

The estimated value of the article may be readily understood by the prices paid in Paris, and the distance to which it is carried.—The price varies from *six* to *eight* francs the *hectolitre*, which is equal to about 3½ cubic feet, or to two and eight-tenths Winchester bushels; which will give about an *average* of 47 to 50 cents per bushel—and then it is transported from 60 to 100 miles from Paris, and even *exported* to the *West India Islands*.

Chaptal entertained a high opinion of the value of this manure, and speaks of it as follows:—"This pulverulent product is sought for by our Agriculturists, who acknowledge its good effects; let us hope, that becoming more enligtened, they will employ the fecal matter itself, as being more rich in nutritive principles, and abounding equally with salts; they can easily govern and moderate the too powerful action of this, by fermentation, or what is better, by mixing with it plaster, earth, and other absorbents, to correct the odor." The suggestions of Chaptal induced a distinguished chemist of Paris, in connexion with a friend of his, to undertake a series of experiments, to ascertain whether *Poudrette* could not be made, of *equal quality*, without the necessary delay of *solar* evaporation, as in France; or by *artificial* heat, as in London,—which experiments were, we are satisfied, *altogether successful*—and the coadjutor and friend of that chemist is now in this city, and will undertake the superintendance and management of the *scientific* and *mechanical* department of a company in this city, for its manufacture, as soon as *five thousand dollars more* are subscribted, to provide the necessary outfit and buildings.

The general business of the company, will be under the superintendance and management of an active business man, who will give information, and receive subscriptions at *this office*.

It has been ascertained that from *one thousand five hundred*, to *two thousand* bushels may be made *per day*, in this *city*, from the materials which are *now thrown away*—and that it would be worth from *twelve and a half, to twenty-five cents* per bushel. Taking the lowest *quantity* and *price*, it would be worth over *one hundred and eighty* dollars per day, for at least 250 days in the year, the average working time.

Of the *improved* process of preparation, we will say that it is simple when understood: it is completed in from *twelve, to forty-eight* hours, by the addition of a preparation, or *compound of vegetable substances*, which disinfects it of, or allays the odor, *without deteriorating* the quality of the manure; aided by machinery which prepares it for use, by dividing it into particles while drying, from the size of *a mustard seed, to that of a hens egg*—or it may be reduced to a powder and put into barrels, or made into cakes of any size and dried for transportation, and then ground for use.

The *entire* cost of outfit, including *teams*, apparatus, machinery, and buildings, for preparing *fifteen hundred bushels per day*, will be less than fifteen thousand dollars: and six thousand dollars will commence it on the scale of 500 bushels per day. The *capital* to be entitled to *one-third* of the profits, which will be over *four per cent a month*—and subscribers to the amount of *five hundred dollars* to have the privilege of using manure at *half* the market price.

☞ When in successful operation in *this* city, measures will be taken to give other cities, and large towns, the benefit of so valuable an improvement in city and agricultural economy.

Any information in our possession will be cheerfully communicated, as our desire is to contribute all in our power to the *cause* of agriculture and health.

Buckwheat.—Let no Farmer who has ground to spare, neglect to put in a few acres of this excellent grain; while its flour commands a ready sale and good price, its straw is among the best hay that he can give to his milch cows.

From the Farmer and Gardener.

We have upon repeated occasions urged the culture of *Millet* as *hay*, upon the consideration of our readers, and we are happy to know, that those recommendations have had their effect in numerous instances. Encouraged by our success, heretofore, we take the liberty of again respectfully urging upon such of our subscribers, as may apprehend short crops of hay, to devote a few acres to its cultivation. Its rapid growth, great yield, and the ease with which it may be cured, are qualities which certainly commend it to favor. In six weeks from the time of sowing last year, we committed it to the hands of the mowers, and never saw a larger or more nutritious body of hay garnered from the same quantity of land in our life.

On good ground, ordinarily manured, we have no hesitation in saying that it will yield from 3 to 4 tons to the acre; on good ground without manure, it will bring at least 2 tons to the acre, and last, though not least, it is so easily cured; half a day's exposure in the *swarth* to the sun, being all that is required; after which it should be cured in cocks; turning these once a day for two or three days, when it may safely be put away; but if it be desirable to make it acceptable to the stock, it should be salted when stowed away, in the proportion of one peck of salt to the ton. By using salt in this way, it is not necessary to give that condiment to the stock fed on it.

We have heard it urged against the culture of Millet, that it required rich ground; now we would ask, can any reasonable man expect large product of any thing unless it be placed on soil competent to produce it? If there be such, all we have to say is, that they are unreasonable beings, and require more than common sense would justify them in asking. But we maintain, that millet

does not require such extraordinary strength of soil. We raised ten tons last year off of two and three-quarter acres of ground, which was not originally *rich*. It is what farmers call *kind* land; a deep sandy loam. It had, to be sure, been *rested*, as the phrase has it, for several years, and depastured by cows. But we did not put on it a single ounce of manure of any kind: we ploughed it twice, harrowed it an equal number of times and then sowed it with millet, at the rate of half a bushel to the acre. We directed a bushel to be sown, but one half of the seed we gave out were not sown; had they been, we have no doubt a larger yield and better hay would have been the result.

Again,—we have often heard the objection made to *Millet* that it made a *coarse* hay! Now this is an evil, if it be one, that may very readily be remidied. Millet will only grow rank where *extra* space and aliment are present to push forward its growth. If an *extra* quantity of seed be cast on the earth, the consequence is, that a *sizable* grass will grow thereon, which, while it adds to *quality*, in its superior fineness, increase the bulk and weight.

We have heard it stated too, that it is a great *exhauster* of land, and so far as theory and philosophy may go, it is very natural to suppose that like all other rapid growers, it is an *exhauster*, for it is consonant to reason to presume, that any vegetable that comes to maturity so early must necessarily draw upon the soil for its support, with no very stinting hand; but then, we believe that, from the rapidity with which it covers and shades the soil from the influence of the sun, that it is not so exhausting as many other crops. In corroboration of this opinion, we would offer a fact, afforded by the ground itself. The lot on which we grew our Millet last summer, we put in Rye the last winter, without giving to it a grain of manure, and have now standing on it as fine a crop as we could desire, without subjecting ourself to the imputation of being avaricious. Now, if the Millet was really as exhausting as represented, could the rye have so successfully grown on it under the circumstances that it has? We think not.

If we were asked what quantity of Millet seed we would sow to the acre, we would reply, that never less than three pecks, or a bushel where we wanted the product for *hay*, and half a bushel if for seed.

Horses and stock of all kinds eat it with avidity, and it may be set down as a proposition perfectly defensible, that two tons of *good* Millet hay, contains as much nutritive matter as three of *Timothy*.

There is another reason of no mean importance why Millet should be cultivated. It is beyond all question the best crop that can be put in to prepare ground for Timothy; its rapid growth, entirely suppressing that of weeds of every description, and leaving the soil in that wholesome condition when nothing is required, but to harrow in the seed, to insure a good and well set crop of Timothy, without any additional trouble or expense of after ploughing.

From the Genesee Farmer.

IS FARMING PROFITABLE.

We ask for the following communication, an attentive perusal. It sets forth a few of the advantages of agricultural pursuits—and should induce many, who are useless drones to become useful members of society, by tilling the soil, from whence they may always draw a competence and *independance*.

In prosecuting the business of life, it is very desirable to do it in such a manner that, so far as regards temporal matters, competency at least may be secured; and the way in which this can be done the most easily, effectually, and with the least probability of reverses, becomes an inquiry of considerable interest. We speak now of the ordinary means of obtaining a good living, of the regular prosecution of professional business, of the usual results of trade, of money at the legal rates of interest, and farming as it has been on the average for the last five years. Now in some respects, the "times are out of joint;" all the customary modes of doing business seem to be broken up; men are in haste to be rich; and the opportunities for speculation, and the success which in some instances has attended it, appear to have had their influence every where—less perhaps among farmers than any other class of citizens, though even for them it will not do to plead entire exemption. Many have sold their farms, and after spending months in looking for others, have come again and consented to pay roundly for the privilege of getting on to the "old place" again. Other farmers have sold out, and without personal investigation, have at once started for that earthly paradise the far west. Disappointed, they have returned, and after having lost most of their property in the expenses of removal, are content to again commence a gradual accumulation of property. But a great majority are still working on, sowing and reaping, and it is a question which should be solved, whether such are not on the whole making money as fast as they probably would with the *same capital* in any other legitimate business. What we mean is, can a man with five or ten thousand dollars, realize as much from it by investing in a farm, as he could by loaning it at the legal rate of interest; and will it support himself or his family as handsomely in the first way as the last? To contribute our mite towards answering these questions, is the object of this paper.

The man who expects to get rich at once by farming, must expect to be disappointed; but in this matter he is no worse off than he who has only the same moderate capital in cash, and uses it in a legal way. In both cases the addition to the capital stock, can consist only of what remains of the income after *all* demands upon it are met. We will attempt to illustrate this. Two men, A. and B., are about to commence life with the same capital, say five thousand dollars in cash each; and their personal expenses are also the same. A. invests the whole of his in a farm, and stock, and goes to work upon it. B. is apprehensive he could not live so, and invests his cash in stock which yields him seven per cent., and determines to do enough to pay his way, so that the interest shall be clear; now which of the two are the most likely to possess competence, if not actual wealth, at the end of ten years? Perhaps a majority at first thought would say B. certainly; but we think differently, and imagine that the chances are altogether in favor of A., and these are some of the reasons for this opinion.

In the first place his occupation is favorable to health. The life of a farmer is one of labor, it is true; but labor, unless carried to excess, if far from being prejudicial to the body or the mind. Vigorous exercise, such is the law of our natures, is necessary to the full developement of either our bodily or mental powers, and unless this necessity is forced upon us in part, we are apt to evade it, and we suffer in consequence. The maxim, that *every man naturally is as idle as he can be*, we do not dispute; acquired habits, induced by the necessity for exertion, are sufficient to account for any seeming exceptions to this rule. Hence the probability is, that A., having before his eyes the necessity of labor on his farm, will perform the labor, and reap the double benefit in his health and in his purse; while B., who cannot expect to feel that necessity, will of course be less active and industrious, will become less and less inclined to labor, and will eventually feel the effects of this disinclination in diminished health and decreasing profits.

Another reason why the prospects of A. are better than those of B. is to be found in the *habits* that personal industry is almost sure to create. Experience and observation both assure us, that the man who has any means of living beyond what depends on his own exertion, is very apt to acquire contemptuous ideas of economy, and whatever may be his original intentions, sooner or later finds himself trenching first on the interest of his capital, and then on the capital itself. There can be very few instances found in the country, where the sons of rich men have not diminished the inheritance received from their parents, and the examples are still more rare in which the second generation have not succeeded in scattering the descending property to the winds. A pride, as false as it is injurious, makes those who *can* live upon their money, dislike exertion, until this dislike becomes a habit, rarely shaken off, even after its effects are staring the individual in the face.

But the most sufficient reason of all why A. will succeed, while B. will probably fail, is found in the fact, that money invested in farming is far better than money at 7 per cent. This we think will be questioned by few who have been in the habit of observing what passes around them, or examining the reports made of particular farms which have from time to time appeared in the farming journals of the day. In all such reports it is evi-

dent, that after deducting the expense of working, a certain per cent. for the wear and tear, and the necessary repairs, and the interest of the capital employed, the remainder will be clear profits. The amount of this profit will depend on circumstances. The expense of working a grain farm will be greater than on a grazing farm, but the capital employed in stocking is less, and the profits usually much higher; the returns for labor are quicker, and the proceeds accumulate in a compound ratio.

There have been quite a number of farm reports given to the public through the agricultural journals, but we do not recollect one in which the expense of working was given with precision. The value of the products of the farm have been stated, and the reader has been left to form his own estimate of the amount to be deducted for the items of expense mentioned above, and in most cases the amount of capital employed has been left to conjecture. How then shall the actual expenditure of the farmer be estimated?—for unless this can be done with an approximation to accuracy, it is evident the clear profits of a farm can not be known.

We have been convinced by observation and experience, and by estimates made with as much care as possible, that one-third of the proceeds of a farm will amply suffice to cover all the ordinary expenditures, or in other words, will pay for working, keep the farm in repair, and re-place the interest on the capital. We are sustained in this position by a communication from Dr. Beekman, the Secretary of the State Ag. So., addressed to the editor of the Farmers' Reg., Petersburgh, Va., in which he states, that except in extraordinary cases, one-third of the products will meet all expenses, leaving two-thirds as profit.

Mr. T. S. Vary, of Kinderhook, made a report of his farm for the Cultivator, in which he estimates the proceeds from 145 acres of land at $2,285. Deduct one-third of this, and there is left $1,524, which is the interest of $21,772; Mr. Vary did not state his capital or the value of his land, but the profits would pay the interest on 145 acres at $150 an acre—probably more than double its actual price.

Mr. Carter, of Champion, Jefferson county, has furnished Judge Buel a farm report, which makes a total of $1,639 from 100 acres. Among the items is one not usually found on farms, viz: mulberry trees, and which to Mr. C. are quite a source of profit. This amount, less one-third as expenses, &c., would leave $1,093 as profit, or the interest on a capital of $15,600, which would fix Mr. Carter's 100 acres at $156 an acre—a price which would make the good farmers of Jefferson county open wide their eyes.

We have been furnished by a friend with two farm reports, which, though more full than the foregoing, as they state the capital employed, are still deficient in not giving an accurate account of the expenses of cultivation. The first report is from a farm on which 86 acres are under cultivation, and the capital, including farm and stock, is estimated at $4,500. The proceeds of this farm are given as follows:

Wheat,	$160	Wool,	$112
Barley,	111	Sheep,	24
Oats,	350	Dairy,	50
Hay,	240	Beef,	80
Peas,	40	Grass seed,	35
Pork,	150		
Potatoes,	40		$1,442
Ruta Baga,	50		

Making a total of $1,442, after leaving many minor sources of profit out of the account, such as two or three acres of poor corn, and other things of which the value was not ascertained. The crop of wheat on this farm was reduced at least two thirds by the severe winter, yet after deducting one-third of the whole, a profit of $962 is left. This sum would be worth the interest of $13,742; or in other words, the capital in this case pays an interest of 21 per cent. The cultivated land of this farm at legal interest, would be worth $159 an acre.

The other report is from a small farm, 40 acres under cultivation, and the capital in farm and stock estimated at $1,600. The following is the list of the items, with their value; and it should be added that the report is for 1835, when farm produce, as will be seen from the prices, was from 10 to 20 per cent. below its present value.

Oats, 310 bushels,	44 cents.	$135.62
Potatoes, 340,	25	85.00
Ruta baga, 240	25	60.00
Buckwheat, 24,	50	12.00
Corn, 100,	50	50.00
8 pigs,	$2.00	16.00
15 lambs,	1.00	15.00
20 tons hay,	6 00	120.00
1 colt,	20.00	20.00
Cheese, 11 cwt. at	07	77.00
Butter, 605 lbs.	15	90.75
Eggs,	12	3.12
Beef, 16 cwt.	3.50	56.00
Pork, 8 "	5.00	40.00
Wool, 80 lbs.	50	40 00
Grass seed,		6.00
Peas, 50 bush.	50	25.00
		$851.49

Deduct as before one-third from the above total, and we have $567.66, as the profits of 40 acres. This would be the interest of $8,100, or on the value of 40 acres at $200 per acre. This farm pays 35 per cent. on the capital at the above estimates of expense and profit, a fact which goes far to prove the conclusion often advanced in this journal, that small farms yield a greater profit than large ones, as they are in general much better cultivated.

But it is very possible some will contend that one-third of the products will only pay for cultivation and repairs, and that the interest of the capital employed should still be deducted in order to give a correct view of the comparative profits of A. and B. We will do this, and it will be seen that the farm which is estimated at $4,500 pays 14 per cent. on the capital, and the one estimated at $1,600, 28 per cent. on the sum invested. These two reports have not been given because there was any thing extraordinary in the amount of their products; on the contrary, we imagine there are few good farms which might not equal or exceed them. Our object has been to call the attention of farmers to a proper estimate of their advantages, and show that money might be safely and profitably invested in the business of cultivating the soil.

List of Subscribers to the Railroad Journal that have paid.—Continued.

D. H. Schmidtt & Son, City of New-York,	Jan. 1, 1838
M. Braem, "	June 17, 1838
Benj. Chapman, Trenton, N. J.,	Jan. 1, 1838
A. Munson, Utica, N. Y.,	" "
E. F. Cushman, Troy, "	Oct. 1, 1837
R. M. Boughton, Poughkeepsie, N. Y.,	Jan. 1, 1838
H. S. Dexter, Rochester, "	" "
J. P. Jackson, Newark, N. J.,	June 1, 1837
J. C. Cabell, Richmond, Va.,	Jan. 1, 1838
S. S. Baxter, " "	" "
Ezra Walker, Charleston, Va.,	April 1, 1838
Owen P. Owens, New Albany, Inda.,	Jan. 1, 1838
S. Breese, Carlyle, Ill.,	" "
E. B. Talcott, Chicago, Ill.,	" "
Wm. Gooding, " "	" "
A. M. Jenkins, Edwardsville, Ill.,	June 1, 1837
M. Tuomy, Littleton, N. C.,	June 17, 1838
D. Griffin, Macon, Geo.,	Jan. 1, 1838
Gen. L. L. Criffin, " "	July 1, 1838
F. H. Petrie, Natches, Miss.,	Jan. 1, 1838
W. Petrie, Jackson, "	" "
Howland, Ward & Spring, Charleston, S. C.,	July 1, 1837
H. H. Gird, Jackson, La.,	Aug. 1, 1837
J. Nichols, " "	" "
S. McCaleb, " "	" "
Rev. J. Sharmon, " "	" "

Pontchartrain R. R. Company, New-Orleans, La., Jan. 1, 1838				
J. B. B. Vignil,	"	"	"	"
J. Fowler, Jr.,	"	"	"	"
W. C. Claiborne,	"	"	"	"
F. B. Le Bean,	"	"	"	"
John Hewlett,	"	"	"	"
P. Guesnon,	"	"	"	"
S. W. Oakey,	"	"	"	"
H. Turner,	"	"	"	"

New-York, June 15th, 1837.

THIRD ANNUAL FAIR OF THE MECHANICS' INSTITUTE OF THE CITY OF NEW-YORK.

The *Fair* of the Institute will be held at Niblo's Garden, commencing Monday, September 25th, 1837.

To render this exhibition worthy of the arts and of the ingenuity of the Mechanics of our country, the Managers appointed to conduct the approaching *Fair* have determined to make such liberal arrangements as will insure to the contributors a fair opportunity of exhibiting their productions to the greatest advantage.

The object of Exhibition Fairs is to present to the members of the Institute and their fellow citizens who are engaged in the Mechanic Arts, the means of making their skill and ingenuity known in a way no other facilities afford: the many thousands who visit such exhibitions have a much better opportunity of judging of the merits of the various productions, than they would have by a mere verbal or newspaper description, besides the advantage of seeing brought together, in one vast collection, the products of the skill, ingenuity, and industry of our country.

PREMIUMS of Medals, Diplomas, &c. will be awarded for *all* worthy or meritorious articles exhibited, either as it respects superior workmanship, machinery wherein the operations are new, interesting or important, where ingenuity is displayed, or taste manifested, and particularly for all new and useful inventions.

You are respectfully requested to send, for competition or exhibition, specimens of the articles you manufacture; and you may be assured that the strictest impartiality will be observed in the distribution of the Premiums.

Steam power will be provided for the accommodation of those who wish to exhibit Machinery in operation; an experienced Superintendant will take charge of this department, and contributors in this branch are particularly invited to send or bring their Machines or models as early as possible, on the 23d September, that the necessary arrangements may be made in relation to shafting, pullies, &c.

The Managers, in conclusion, cannot but express their belief that this Third Fair of the Mechanics' Institute, will exceed in variety and beauty of display, all previous exhibitions of the kind.

GEORGE BRUCE, *Chairm.*
WM. EVERDELL,
C. CROLIUS, JUN.
THOS. EWBANK,
RICHARD BRAGAW,
} *Executive Committee.*

N. B. All articles for competition must be delivered to the Committee at Niblo's Garden, on the 23d September. Those for exhibition *only* will be received any day during the Fair, before 10 o'clock A. M.

RULES AND REGULATIONS.

1.—The Garden will be opened for the reception of Goods, on Saturday, 23d of September, from 6 o'clock A. M. until 9 o'clock P. M., and it is respectfully urged that all articles intended for competition may be sent in early in the day. Those articles intended for exhibition *only* will be received any day during the Fair, before the hour of 10 A. M.

2.—The Fair will open for visitors on Monday, 25th Septem- at 10 o'clock A. M., and continue open every day of the exhibition till 10 o'clock P. M.

3.—Competent and impartial Judges will be appointed to examine all articles presented, and premiums will be awarded on all such as shall be declared worthy.

4.—The Committee on Premiums, and all firms or partnerships in which they may be interested, shall be excluded from competition or the award of any premium.

5.—All persons depositing articles, either for competition or exhibition, must attend to have them registered by the Clerk, at which time they will receive a certificate, which will be required of them when the articles are returned.

6.—Proof of origin must be furnished if required, for any specimen offered for Premium.

7.—Depositors will receive a ticket from the Clerk, which will admit them and Ladies during the Exhibition.

8.—Arrangements will be made to exhibit, in operation, all working models that may be deposited—contributions in this branch are invited—a competent person will take charge of all models sent for the above purpose.

9.—The morning of each day, until fifteen minutes before 10 o'clock, shall be appropriated exclusively to the Judges.

10.—Members will receive their tickets of admission by applying at the Institute Rooms, any time in the week previous to and during the exhibition.

11.—All articles offered by Apprentices, will be received, and adjudged as the production of Apprentices—they must furnish a certificate of name, age, with whom, and the time they have served as apprentices.

12.—Articles subject to injury by being handled, should be secured in glass cases—and contributors are requested to have a person to take charge during the hours of exhibition—in the intervals, efficient measures will be taken to protect property.

GENERAL COMMITTEE.

George Bruce,	John Ridley,
John M. Dodd,	Silas B. Simonson,
James J. Mapes,	Thomas F. Peers,
Thomas Ewbank,	Thomas G. Hodgkins,
Wm. Everdell,	George L. Spencer,
C. Crolius, Jr.,	Peter Wemmell,
A. J. Mason,	Richard Bragaw,
Thos. W. Bartholomew,	Ab'm Peitch,
A. Storms,	Wm. H. Hale,
Wm. Ballard,	Wm. J. Mullen,
Henry Cunningham,	James Thomson,
John Harold,	Abner Mills,
Joseph Trench,	L. D. Chapin,
James D. Phyfe,	A. Cammeyer,
John H. Mead,	Hiram Tupper,
John Conroy,	H. B. Robertson,
Jordan L. Mott,	James Thomas,
Samuel Carter,	H. G. Stetson,
George F. Nesbitt,	Ferris Owen,
Henry Worrall,	N. Berry,
W. B. Worrall,	O. Whittelesey,
James B. Cummings,	M. W. Emmons,
James Frost,	J. S. Anderson.

Advertisements.

If any of our citizens, who have encountered and survived the storm, desire a comfortable residence on a productive farm, in a healthy part of the country, we would invite their attention to the advertisement of Mr. John White, in this number. His farms, we have reason to believe, are well worthy of notice.

GREAT BARGAINS.

THE subscriber offers for sale 322 acres of Land, known as the late Cook & Haner Farms, on the beautiful valley, near Manlius Centre, in this county—the limestone creek running through it, on which are three Dwellings, three Barns, good Orchard, 200 acres under good improvement, the stumps out, and well calculated for two farms. The Erie canal in sight, *south* and the *Syracuse and Utica Railroad located and being made* about 20 rods from and parallel with the *north* line, and where is to be the first watering place and station from Syracuse for tak-

ing in passengers &c. from Fayetteville, the southern and northern villages, &c. For grain, or grass and grain, for the Sugar or Root business, a better soil cannot be found in any country. When this railroad is completed, fifteen or twenty *minutes* of Syracuse, two hours of Utica, a few hours of all the river cities and New-York; indeed, when the railroad now making from Boston to Albany is completed, within a few hours of all the principal eastern cities. Upon these great thorough fares, and all these advantages, surrounded by flourishing villages, strong competition will always secure on the premises, the highest prices for all its products. This is one of the most splendid farms in the state.

ALSO, for sale 120 acres of Land on the Oswego canal *between* and *immediately* at the junctions of the Seneca and Oneida Rivers, embracing the late widow Eno Plat, Tavern stand, &c. &c. The meeting of these splendid rivers, convenient harbor, the canal—one of the great travelling and commercial thorough fares, to the west, the beauty of the spot, surrounded by a fertile country, indicate this as a favorable spot for a flourishing village, or for a residence, farming, gardening, *profit* and *pleasure;* no situation on the North River can be more desirable—the favorable spot for the stations for all the Packet and Line Boats—for a public house, mercantile establishments, and where every thing raised can be sold at the highest prices.

ALSO, a farm of 160½ acres, bounded on the *west* by the Chittenango river, and on the *north* by the flourishing village of Bridgeport, or "the Rifts," two miles south of the Oneida lake, on the northern and shortest travelled road from Utica to Rochester, cultivated, and the stumps out of nearly a hundred acres, fertile and beautiful land, enough of which may be sold for village lots in a few years to pay for the whole. At the head of navigation, at this village, are quite extensive hydraulic advantages —mills, carding and dressing, tannery, stores, public houses, schools, &c. &c. combining to render this a very desirable farm

ALSO, a valuable Cedar Lot about two and a half miles north of Chittenango.

ALSO, as Agent some very valuable Farms in Onondaga and Madison counties.

The above mentioned Farms will be sold on highly advantageous terms. JOHN WHITE.

Syracuse, Onondaga, Co. New-York., June, 1837. 10—m4

AVERY'S ROTARY STEAM ENGINES.—AGENCY.—The subscriber offers his services to gentlemen desirous of procuring Steam Engines for driving SAW-MILLS, GRAIN-MILLS, and OTHER MANUFACTORIES of any kind.

Engines only will be furnished, or accompanied with *Boilers* and the necessary *Machinery* for putting them in operation, and an Engineer always sent to put them up.

Information will be given at all times to those who desire it, either by letter or by exhibiting the engines in operation in this city.

Inquiries by letter should be very explicit and the answers shall be equally so. D. K. MINOR,

30 Wall-st., New York.

FOR SALE AT THIS OFFICE,

A Practical Treatise on Locomotive Engines, with Engravings, by the CHEVALIER DE PAMBOUR—150 pages large octavo—done up in paper covers so as to be sent by mail—Price $1 50. Postage for any distance *under* 100 miles, 40 cents, and 60 cts. for any distance exceeding 100 ms.

ALSO—*Van de Graaff on Railroad Curves,* done up as above, to be sent by mail—Price $1. Postage, 20 cents, or 30 cents, as above.

ALSO—Introduction to a view of the works of the *Thames Tunnel*—Price *fifty cents.* Postage as above, 8 cents, or 12 cts.

*** On the receipt of $3, a copy of each of the above works will be forwarded by mail to any part of the United States.

DRAWING INSTRUMENTS.—E. & G. W. Blunt, 154 Water-street, New-York, have received, and offer for sale, Drawing Instruments of superior quality, English, French, and German Manufacture.

They have also on hand Levels of superior quality at low prices.

☞ Orders received at this office for the above Instruments.

MECHANICS' FAIR.

Notice to Mechanics, Artisans, Manufacturers, &c.—The undersigned give notice that the first Annual FAIR of the Massachusetts Charitable Mechanics' Association will be held in the city of Boston, in September next, commencing on Monday, the 18th, and continuing at least three days.

The Association have placed at the disposal of the Board of Managers, the sum of Five Thousand Dollars, to enable them to conduct the Fair upon a liberal scale; and they hope to be able to render satisfaction to all who may feel disposed to offer articles for exhibition.

Medals or Diplomas will be awarded to the owners of all articles that may be deemed worthy of such distinction; and the Managers intend that the strictest impartiality and fairness shall be observed in the distribution of Premiums.

The Managers, in furtherance of the subject they have in view, invite contributions, of articles from every department of industry; of choice specimens of American ingenuity and skill; rare and valuable domestic productions, natural or artificial; the delicate and beautiful handiwork of females; useful labor-saving machines, implements of husbandry, and new models of machinery in all their varieties.

Judges will be appointed to examine all articles offered, and the managers will award a gold or silver medal, or a diploma, to all articles that may be pronounced by the judges worthy of reward.

Articles intended for exhibition, must be delivered on or before Wednesday, September 13th.

Arrangements will be made to exhibit, *in operation,* any working models that may be offered, which will render the exhibition useful and interesting, and the managers respectfully invite contributions in this branch. A careful and competent superintendent will be appointed to take chare of all models sent for this purpose.

Board of Managers.

Stephen Fairbanks,	Jos. T. Buckingham,
John Rayner,	James Clark,
William Adams,	Henry W. Dutton,
Uriel Crocker,	George Darracott,
Gardner Greenleaf,	Wm. S. Pendleton,
James L. Homer,	Charles A. Wells,
James Barry,	Henry Bailey,
Joseph Tilden,	Jonas Chickering,
Ephraim Harrington,	Henry H. Barton,
Joseph Lewis,	Thomas Boyd,
Walter Frost,	Wm. Uunderwood,
Thomas J. Shelton,	George G. Smith,

John G. Rogers.

P. S. For any further information address JAMES L. HOMER, Corresponding Secretary, Boston.

Boston, March 24, 1837. m28–ts1

TRANSACTIONS OF THE INSTITUTION OF CIVIL ENGINEERS OF GREAT BRITAIN.

The first volume of this valuable work, has just made its appearance in this country. A few copies, say *twenty-five* or *thirty* only, have been sent out, and those have nearly or quite all been disposed of at *ten dollars* each—a price, although *not* the *value* of the work, yet one, which will prevent many of our young Engineers from possessing it. In order therefore, to place it within their reach, and at a convenient price, we shall *reprint* the entire work, with ll its enagravings, *neatly done* on wood, and issue in six *parts* or *numbers,* of about 48 pages each, which can be sent to any part of the United States by mail, as issued, or put up in a volume at the close.

The price will be to subseribors *three dollars,* or *five dollars* for two copies—*always in advance.* The first number will be ready for delivery early in April—Subscriptions are solicited.

☞ TO RAILROAD COMPANIES.

A PERSON experienced in the construction of Locomotive Engines (many of his Manufacture being in successful operation on important Railroads in the United States) and who is likewise thoroughly acquainted with the management of such machines, and, indeed, the entire ordeal of Railroads, is desirous of obtaining the situation of General Superintendant on some Railroad, South or West.

The most satisfactory testimonials of character and capability can be produced. Communications addressed to the Editors of this Journal, stating the location of Road, &c. will meet with prompt attention. 9t—24

PATENT RAILROAD, SHIP AND BOAT SPIKES.

*** The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years successful operation, and now almost universal use in the United States, (as well as England, where the subscriber obtained a patent,) are found superior to any ever offered in market.

Railroad Companies may be supplied with Spikes having countersink heads suitable to the holes in iron rails to any amount and on short notice. Almost all the Railroads now in progress in the United States are fastened with Spikes made at the above named factory—for which purpose they are found invaluable, as their adhesion is more than double any common spikes made by the hammer.

*** All orders directed to the Agent, Troy, N. Y., will be punctually attended to.

HENRY BURDEN, Agent.

Troy, N. Y., July, 1831.

*** Spikes are kept for sale, at factory prices, by I. & J. Townsend, Albany, and the principal Iron Merchants in Albany and Troy; J. I. Brower, 222 Water street, New-York; A. M. Jones, Philadelphia; T. Janviers, Baltimore; Degrand & Smith, Boston.

P. S.—Railroad Companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufacturing so as to keep pace with the daily increasing demand for his Spikes. (1J23am) H. BURDEN.

TO CONTRACTORS.

JAMES RIVER AND KANAWHA CANAL.

THERE is still a large amount of mechanical work to let on the line of the James River and Kanawha Improvement, consisting of twenty locks, about one hundred culverts and several large aqueducts, which will be offered to responsible contractors at fair prices.

The locks and aqueducts are to be built of cut stone.

The work contracted for must be finished by the 1st day of July, 1838.

Persons desirous of obtaining work are requested to apply at the office of the undersigned, in the city of Richmond, before the fifteenth of May, or between the fifth and the fifteenth of July.

CHARLES ELLET, Jr.
Chief Engineer Jas. Riv. & Ka. Co.

P. S—The valley of James River above Richmond is healthy.

16—10t

TO RAILROAD CONTRACTORS.

SEALED proposals will be received at the office of the Selma and Tennessee River Railroad Company, in the town of Selma, Alabama, for the graduation of the first forty miles of the Selma and Tennessee Railroad. Proposals for the first six miles from Selma, will be received after the first of May, and acted on by the Board on the 15th May. Proposals for the ensuing 34 miles, will be received after the 10th May, but will not be examined until the 1st of August next, when the work will be ready for contract.

The line, after the first few miles, pursuing the flat of the Mulberry Creek, occupies a region of country, having the repute of being highly healthful. It is free from ponds and swamps, and is well watered—The soil is generally in cultivation, and is dry, light and sandy, and uncommonly easy of excavation.—The entire length of the line of the Selma and Tennessee Railroads, will be about 170 miles, passing generally through a region as favorable for health as any in the Southern Country.

Owing to the great interest at stake in the success of this enterprise, and the amount of capital already embarked in it, this work must necessarily proceed with vigor, and I invite the attention of men of industry and enterprise, both at the North and elsewhere to this undertaking, as offering in the prospect of continued employment, and the character of the soil and climate, a wide and desirable field to the contractor.

Proposals may be addressed either to the subscriber, or to General Gilbert Shearer, President of the Company.

ANDREW ALFRED DEXTER, Chief Engineer
Selma, Ala., March 20th, 1837. A 15 tf

ROACH & WARNER,

Manufacturers of OPTICAL, MATHEMATICAL AND PHILOSOPHICAL INSTRUMENTS, 293 Broadway, New York, will keep constantly on hand a large and general assortment of Instruments in their line.

Wholesale Dealers and Country Merchants supplied with SURVEYING COMPASSES, BAROMETERS, THERMOMETERS, &c. &c. of their own manufacture, warranted accurate, and at lower prices than can be had at any other establishment.

Instruments made to order and repaired. 14 1y

FRAME BRIDGES.

THE undersigned, General Agent of Col. S. H. LONG, to build Bridges, or vend the right to others to build, on his Patent Plan, would respectfully inform Railroad and Bridge Corporations, that he is prepared to make contracts to build, and furnish all materials for superstructures of the kind, in any part of the United States, (Maryland excepted.)

Bridges on the above plan are to be seen at the following localities, viz. On the main road leading from Baltimore to Washington, two miles from the former place. Across the Metawamkeag river on the Military road, in Maine. On the national road in Illinois, at sundry points. On the Baltimore and Susquehanna Railroad at three points. On the Hudson and Patterson Railroad, in two places. On the Boston and Worcester Railroad, at several points. On the Boston and Providence Railroad, at sundry points. Across the Contoocook river at Henniker, N. H. Across the Souhegan river, at Milford, N. H. Across the Connecticut river, at Haverhill, N. H. Across the Contoocook river, at Hancock, N. H. Across the Androscoggin river, at Turner Centre, Maine. Across the Kennebec river, at Waterville, Maine. Across the Genesse river, at Squakichill, Mount Morris, New-York. Across the White River, at Hartford Vt. Across the Connecticut River, at Lebanon, N. H. Across the mouth of the Broken Straw Creek, Penn. Across the mouth of the Cataraugus Creek, N. Y. A Railroad Bridge diagonally across the Erie, Canal, in the City of Rochester, N. Y. A Railroad Bridge at Upper Still Water, Orono, Maine. This Bridge is 500 feet in length; one of the spans is over 200 feet. It is probably the FIRMEST WOODEN BRIDGE ever built in America.

Notwithstanding his present engagements to build between twenty and thirty Railroad Bridges, and several common bridges, several of which are now in progress of construction, the subscriber will promptly attend to business of the kind to much greater extent and on liberal terms. MOSES LONG.

Rochester, Jan. 13th, 1837. 4—y

ALBANY EAGLE AIR FURNACE AND MACHINE SHOP.

WILLIAM V. MANY manufactures to order, IRON CASTINGS for Gearing Mills and Factories of every description

ALSO—Steam Engines and Railroad Castings of every description.

The collection of Patterns for Machinery, is not equalled in the United States. 9—1y

NEW ARRANGEMENT.

ROPES FOR INCLINED PLANES OF RAILROADS.

WE the subscribers having formed a co-partnership under the style and firm of Folger & Coleman, for the manufacturing and selling of Ropes for inclined planes of railroads, and for other uses, offer to supply ropes for inclined planes, of any length required without splice, at short notice, the manufacturing of cordage, heretofore carried on by S. S. Durfee & Co., will be done by the new firm, the same superintendant and machinery are employed by the new firm that were employed by S. S. Durfee & Co. All orders will be promptly attended to, and ropes will be shipped to any port in the United States.

12th month, 12th, 1836. Hudson, Columbia County State of New-York.

ROBT. C. FOLGER,
33—tf. GEORGE COLEMAN,

AMES' CELEBRATED SHOVELS, SPADES, &c.

300 dozens Ames' superior back-strap Shovels
150 do do do plain do
150 do do do cast steel Shovels & Spades
150 do do Gold-mining Shovels
100 do do plated Spades
50 do do socket Shovels and Spades.

Together with Pick Axes, Churn Drills, and Crow Bars (steel pointed,) manufactured from Salisbury refined iron—for sale by the manufacturing agents,

WITHERELL, AMES & CO.
No. 2 Liberty street, New-York.
BACKUS, AMES & CO.
No. 8 State street, Albany

N. B—Also furnished to order, Shapes of every description, made from Salsbury refined Iron v4—tf

STEPHENSON,

Builder of a superior style of Passenger Cars for Railroads.

No. 264 Elizabeth street, near Bleecker street, New-York.

RAILROAD COMPANIES would do well to examine these Cars; a specimen of which may be seen on that part of the New-York and Harlaem Railroad now in operation J25tf

RAILWAY IRON, LOCOMOTIVES, &c.

THE subscribers offer the following articles for sale.

Railway Iron, flat bars, with countersunk holes and mitred joints,

						lbs.	
350 tons	2½	by	½,	15 ft in length, weighing		4 66/100	per ft.
280 "	2	"	½,	"	"	3 50/100	"
70 "	1¾	"	½,	"	"	2¾	"
80 "	1½	"	½,	"	"	1 25/100	"
90 "	1	"	½,	"	"	¾	"

with Spikes and Splicing Plates adapted thereto. To be sold free of duty to State governments or incorporated companies.

Orders for Pennsylvania Boiler Iron executed.

Rail Road Car and Locomotive Engine Tires, wrought and turned or unturned, ready to be fitted on the wheels, viz. 30, 33, 36, 42, 44, 54, and 60 inches diameter.

E. V. Patent Chain Cable Bolts for Railway Car axles, in lengths of 12 feet 6 inches, to 13 feet 2¼, 2¼ 3, 3¼, 3½, 3¾, and 3¾ inches diameter.

Chains for Inclined Planes, short and stay links, manufactured from the E. V. Cable Bolts, and proved at the greatest strain.

India Rubber Rope for Inclined Planes, made from New Zealand flax.

Also Patent Hemp Cordage for Inclined Planes, and Canal Towing Lines.

Patent Felt for placing between the iron chair and stone block of Edge Railways.

Every description of Railway Iron, as well as Locomotive Engines, imported at the shortest notice, by the agency of one of our partners, who resides in England for this purpose.

A highly respectable American Engineer, resides in England for the purpose of inspecting all Locomotives, Machinery, Railway Iron &c. ordered through us.

A. & G. RALSTON & CO.,
28 tf Philadelphia, No. 4, South Front-st

ARCHIMEDES WORKS.

(100 North Moor street, N. Y.)
NEW-YORK, February 12th, 1836.

THE undersigned begs leave to inform the proprietors of Railroads that they are prepared to furnish all kinds of Machinery for Railroads, Locomotive Engines of any size, Car Wheels, such as are now in successful operation on the Camden and Amboy Railroad, none of which have failed—Castings of all kinds, Wheels, Axles, and Boxes, furnished at shortest notice.

4—v1f H. R. DUNHAM & CO.

MACHINE WORKS OF ROGERS,

KETCHUM AND GROSVENOR, Paterson, New-Jersey. The undersigned receive orders for the following articles, manufactured by them, of the most superior description in every particular. Their works being extensive, and the number of hands employed being large, they are enabled to execute both large and small orders with promptness and despatch.

RAILROAD WORK.

Locomotive Steam-Engines and Tenders; Driving and other Locomotive Wheels, Axles, Springs and Flange Tires; Car Wheels of cast iron, from a variety of patterns, and Chills; Car Wheels of cast iron, with wrought Tires; Axles of best American refined iron; Springs; Boxes and Bolts for Cars.

COTTON WOOL AND FLAX MACHINERY,

Of all descriptions and of the most improved Patterns, Style, and Workmanship.

Mill Geering and Millwright work generally; Hydraulic and other Presses; Press Screws; Callenders; Lathes and Tools of all kinds; Iron and Brass Castings of all descriptions.

ROGERS, KETCHUM & GROSVENOR
Patterson, New-Jersey, or 60 Wall street, N.
5tf

TO RAILROAD CONTRACTORS.

PROPOSALS will be received, at the office of the Hiwassee Railroad Com., in the town of ATHENS, TENNESSEE, until sunset, of Monday, June 12th, 1837; for the grading, masonry and bridges, on that portion of the HIWASSEE RAILROAD, which lies between the River Tennessee and Hiwassee. A distance of 40 miles.

The quantity of excavation will be about one million of cubic yards.

The line will be staked out; and, together with drainings and specifications of the work, will be ready for the inspection of contractors, on and after the 1st day of June.

JOHN C. TRAUTWINE,
Engineer in Chief Hiwassee Railroad.
16—6t.